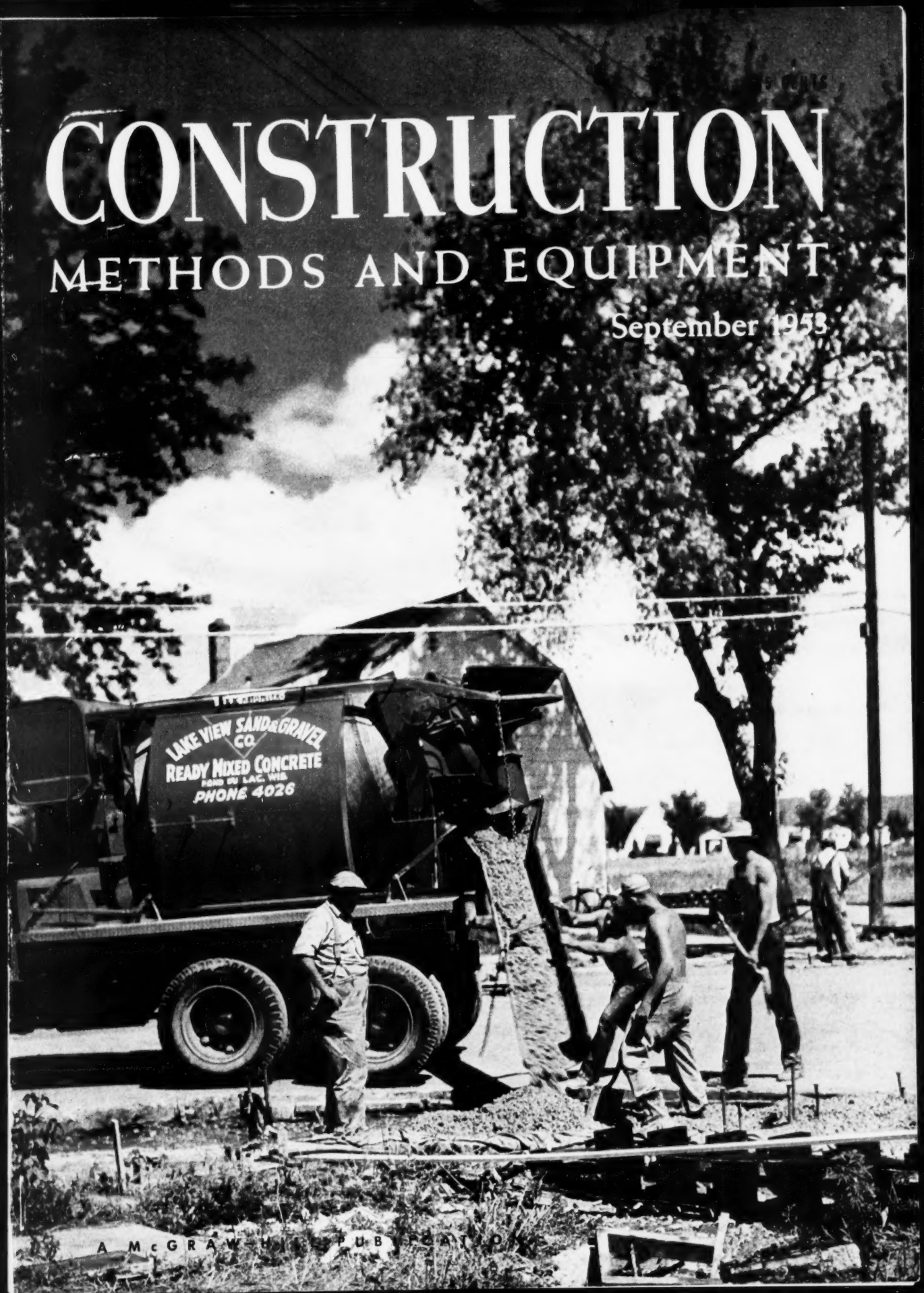
CONSTRUCTION METHODS AND EQUIPMENT

September 1953



A McGRAW-HILL PUBLICATION

OPERATING ECONOMY and flexibility are two advantages of using G-E drives at plant's key points. Aggregates are blended in bin, fed into dryer by elevator, then lifted to top of tower by elevator for screening. Dried aggregate is batched and deposited in mixer, where asphalt from tanks at left is also introduced, then mixed and discharged into trucks.

Asphalt plant electrified for portability, high output

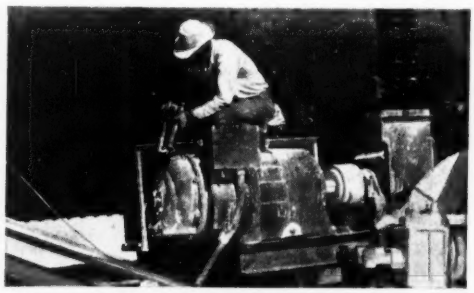
G-E drives simplify operation of 125-ton-an-hour Heldenfels Bros. plant; no repairs needed in two years

This portable motorized asphalt plant—owned and operated by Heldenfels Bros. Co. of Corpus Christi, Texas, and built by Iowa Manufacturing Co., Cedar Rapids, Iowa—is largest in the area. Key to its 125-ton hourly output—approximately twice as much as non-motorized plants—is simplified operation and portability, made possible by co-ordinated General Electric motors and control. Plant is easily broken down for relocation. And, says Mr. F. W. Heldenfels, "not one cent has been spent for electrical repairs in over two years of continuous operation."

The plant's G-E drives provide operating reliability, plus one-man control. The gear-motors, small and light considering their power, take up minimum space, and are remounted quickly. Over-all plant weight is reduced, flexibility added.

For faster, easier, more efficient operation of *your* construction equipment, electrify with G-E drives and power distribution equipment—backed by G-E engineering help in application, installation and service. General Electric, Schenectady 5, N.Y.

1878 75 1953 YEARS OF ELECTRICAL PROGRESS



EASY TO RE-LOCATE G-E motors and control, like this 50-hp totally enclosed gear-motor, can be quickly transported by truck from one job to the next.

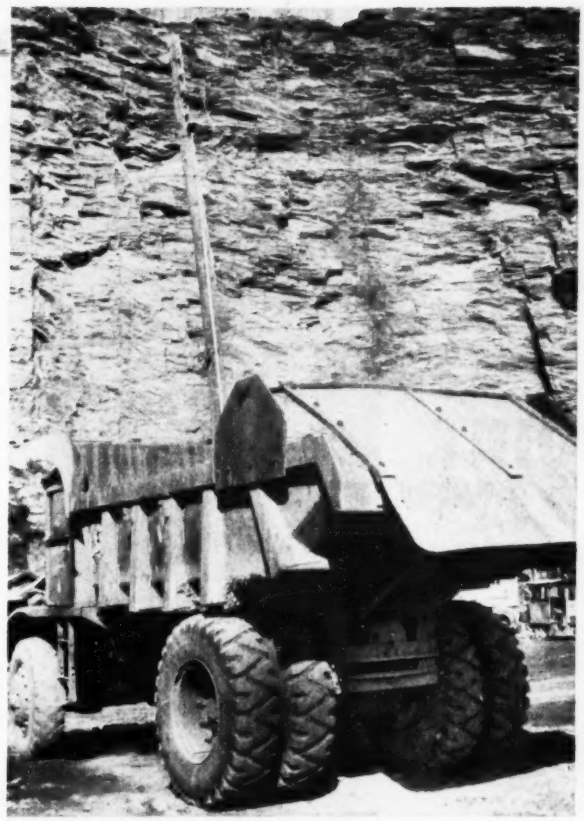
ONE-MAN CONTROL of plant's production is possible with G-E remote control panel in tower, from which dryer, elevators and conveyors are operated.

660-29

Engineered Electrical Systems for Heavy Construction

GENERAL ELECTRIC

B.F.Goodrich



Off-the-road tires carry 30 tons 4,500 hours a year

THE trucks of the Penn Dixie Cement Corporation, Nazareth, Pa., roll over a rock-strewn quarry floor, then back up a steep incline to dump their load of rock. This rugged hauling job goes on more than 80 hours a week—with 15 tons of rock plus a truck weight of 15 tons for the tires to carry.

For such punishing work, the company uses B. F. Goodrich tires exclusively. The report: these tires stand up so well they can be recapped *twice* for 90% of new-tire service per recap! The tires in the picture have already run more than 4,300 hours. The patented B. F. Goodrich nylon shock shield is one reason for this amazing record.

Layers of strong, elastic nylon cords under the tread stretch together to protect the tire body from rock cuts and bruises. This means you get more original hours of service, more recappable tires and more hours of service per recap, increased bruise resistance and less danger of tread separation. You save 4 ways, yet you pay nothing extra for the exclusive nylon shock shield.

B. F. Goodrich Universal tires are built with a specially-compounded tread that resists snags and cuts, gives 2-way traction and longer wear. This is one more reason why you get better performance from B. F. Goodrich off-the-road tires. See the complete money-saving line at your B. F. Goodrich retailer's store. The address is listed under Tires in the Yellow Pages of your phone book. Or mail the coupon below.

Specify B. F. Goodrich tires when ordering new equipment

RESEARCH KEEPS B.F.Goodrich FIRST IN RUBBER

The B. F. Goodrich Company
Department TO-141, Akron 18, Ohio

Please send:

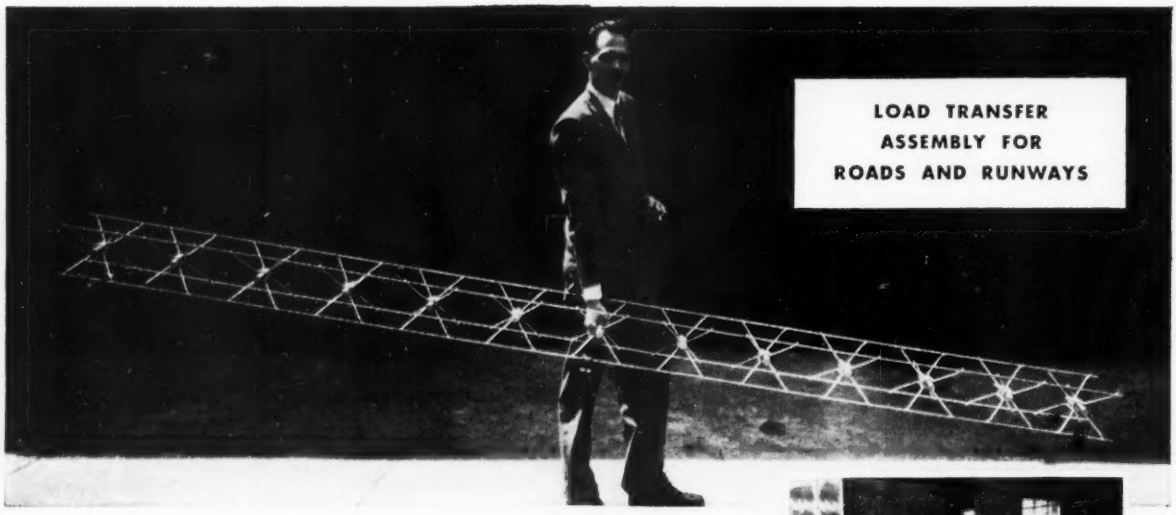
- ☐ Catalog on Universal tires
- ☐ Free booklet, "How to get more recaps out of truck tires"
- ☐ Name of my nearest retailer

Name_____

Company _____

Street _____

City_____ Zone____ State_____



Richmond's
ONE MAN ROAD JOINT
a real cost saver

PRICED COMPETITIVELY with any road joint (dowel supports and other load-transfer units), Richmond's Unit can be completely installed by ONE MAN at much lower cost.

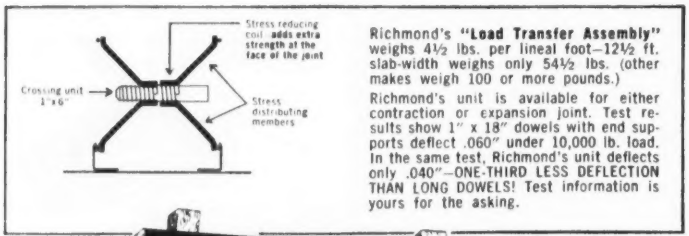
A stronger joint with less deflection and higher ultimate strength. Proven by impartial and authoritative tests over three years... Richmond's one-man road joints were used in one of the world's largest airports. They are now in an important Military Air Base and will soon be used in highways.

RICHMOND'S is different from any road joint you have ever seen. Modern engineering knowledge with Richmond's know-how designed this road joint.

It's a **complete load-transfer assembly.** The rod frame with coils acts as a working part of the unit which aids in reducing concrete stress and in distributing the traffic load. The use of short dowels makes the Richmond unit lighter and less costly...yet...stronger than heavier road joints.

Don't miss this money saver on your job—write to us for data or call one of Richmond's Field-men for discussion.

3 diameter embedment VERSUS 8 diameter embedment



Richmond's **"Load Transfer Assembly"** weighs 4½ lbs. per lineal foot—12½ ft. slab-width weighs only 54½ lbs. (other makes weigh 100 or more pounds.)

Richmond's unit is available for either contraction or expansion joint. Test results show 1" x 18" dowels with end supports deflect .060" under 10,000 lb. load. In the same test, Richmond's unit deflects only .040"—ONE-THIRD LESS DEFLECTION THAN LONG DOWELS! Test information is yours for the asking.

HANDLED BY ONE MAN

INSTALLED BY ONE MAN

STAKED BY ONE MAN

RICHMOND GIVES YOU: KNOW-HOW . . . DEPENDABILITY . . . SERVICE

Why "breathing space" between each wire?

- To provide maximum flexibility—tiny, precise amounts of "breathing space" are engineered between each of these wires.
- There are 295 wires in this particular construction . . . 9 different sizes of wire.
- All wires are drawn in Macwhyte's plant to assure uniform quality.
- Heavy, tenacious lubricants fill the spaces between wires. This *Internal Lubrication* guards against corrosion and friction, and also increases flexibility.
- Macwhyte's PREforming process forms the wires and strands into a spiral so they lie naturally in place with a minimum of internal stress.
- From a thousand and one wire ropes, Macwhyte engineers are ready to recommend the right rope for your particular needs. For best, lowest cost wire rope service, write today for recommendations of the best constructions of rope to use on all your equipment.

This Macwhyte Rope is 6 x 41 Filler Wire PREformed Lang Lay Monarch Whyte Strand with IWRC, just one of the thousand and one wire ropes made by Macwhyte.

MACWHYTE WIRE ROPE

THE RIGHT ROPE FOR YOUR EQUIPMENT

Ask for G-15 Wire Rope Handbook

Macwhyte Company, *2911 Fourteenth Avenue, Kenosha, Wis. Manufacturers of Internally Lubricated PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies, Monel Metal, Stainless Steel Wire Rope and Wire Rope Assemblies. Mill depots: New York • Pittsburgh • Chicago • St. Paul • Fort Worth • Portland • Seattle • San Francisco • Los Angeles • Distributors throughout U.S.A.* 1044

SYMONS 4 Point PLAN

FOR LOW-COST CONCRETE WALL CONSTRUCTION

The Forming System, Engineering Service, Sales Service and Rental-Purchase Plan which make up the Symons 4-Point Plan are ready to go to work for you—regardless of the complexity or size of the application.

1 SYMONS FORMING SYSTEM

. . . includes strong, long-lasting panels that can be easily assembled to form walls of any height or shape; sturdy hardware and ties especially designed to speed erection and stripping. The combination insures a fine job completed in a surprisingly short time with real savings in labor and material costs.

2 SYMONS ENGINEERING SERVICE

. . . is set up to furnish you complete form layouts and job cost sheets on your form work. There is no charge for this service. You just send your plans, we do the rest. You'll be pleased with the clear picture of your job (its costs, bill of materials, and labor saving methods) that the Symons Engineering Service provides.

3 SYMONS SALES SERVICE

. . . means regular on-the-job service. Symons salesmen are always available to make on-the-job recommendations of the forms and hardware needed and to see to it that materials arrive when promised. To further simplify construction, Symons salesmen will assist in the supervision of form erection to assure correct and fast set-up. Another feature of the Symons no charge service plan.

4 RENTAL-PURCHASE PLAN

. . . offers you the opportunity to use the Symons Forming System on a rental basis. Then, if you want to purchase the forms, the rental charge will apply on the purchase price.

Contractors throughout the country have tried the Symons 4-Point Plan and like it. Send in your request for the complete facts —no charge or obligation.

Symons

SYMONS CLAMP & MFG. CO. Dept. I-3
4255 DIVERSEY AVENUE • CHICAGO 39, ILLINOIS

CONSTRUCTION METHODS AND EQUIPMENT

Volume 35, Number 9 **SEPTEMBER 1953** Established 1919

Pay Dirt in This Issue

Simple Prestressing Builds Tampa Bay Bridge 54
An English system is being used in this country for the first time, to construct a concrete trestle 3 1/3 mi long.

Construction Is Rugged on the West Virginia Turnpike 64
"Unclassified excavation with lots of rock" is a common term for 88 mi. There are some 80 bridges and a tunnel.

Plant Improves Gravel Dredged From River Bed 71
Heavy media separation process clears big daily tonnage through compact floating unit requiring little attention.

Divert Stream Over Dam Under Construction 92
Riprap weir, laid to take winter's excess of high water over earthfill dam only partially completed, aids tunnels.

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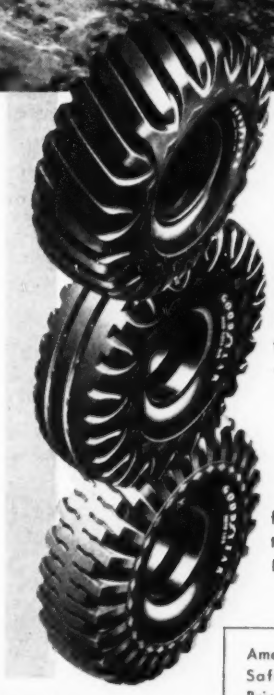
PERFORMANCE PAYS OFF!

THE tires you buy or specify can help keep you ahead of schedule—or drop you into a mess of dead equipment, idle men and busy red ink.

Goodyears are the best workers—the longest wearers—the tires *specifically designed* to thrive on your kind of jobs—to give you lower costs per hour.

It takes worlds of experience to build such tires—and Goodyear has it. Goodyear has built more tires for more specific purposes than anyone else on earth. So when you buy or specify Goodyears, you're buying the tires that can put more money in your pockets. Goodyear, Truck Tire Department, Akron 16, Ohio.



HARD ROCK LUG
for stamina and full pull, forward or reverse, on all kinds of tire-killing work.

HARD ROCK RIB
for front wheels on all tire-killing service. Rugged—smooth rolling—easy steering.

ROAD LUG
for toughness and super-traction OFF the road and long, smooth mileage ON the road.

FOR EACH JOB, THERE'S A COST-CUTTING GOODYEAR TIRE!

America Needs Better, Safer Roads—Let's Bring them Up to PAR

Road Lug—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

GOODYEAR

MORE TONS ARE HAULED ON GOODYEAR TRUCK TIRES THAN ON ANY OTHER KIND

We think you'll like THE GOODYEAR TELEVISION PLAYHOUSE—every other Sunday—NBC TV Network

GAR WOOD
Buckeye

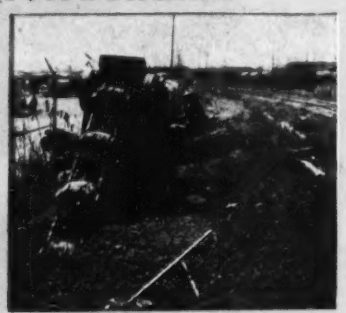
MEDIUM UTILITY DITCHER
...for Greatest Dollar Value!

Buckeye's brand new model 303 is the outstanding wheel-type ditcher for its size and capacity developed in 60 years of Buckeye experience! . . . Low in first cost and easy to maintain it has been "contractor proven" in a wide variety of soils and climates . . . Digs to 5 ft. depths in 10, 12, 14, 16, 18 and 20 in. cutting widths at digging speeds up to 18 f.p.m. . . . Cuts the right size ditch for most applications in city, county and utility work and is ruggedly built to withstand the many abuses usually encountered . . . Small and compact with low ground bearing pressure . . . Positive depth control in hilly and rough terrain . . . Your dealer has complete details and —

Only Buckeye has a Ditcher for every Ditching Job!

BUCKEYE LADDER-TYPE DITCHERS

Give you cutting widths of from 8" to 48" with boom lengths up to 16 ft. for all types of utility work. No matter what machine suits your job—Buckeye makes it!



GAR WOOD INDUSTRIES

GAR WOOD INDUSTRIES, INC.
Findlay Division • Executive Offices • Wayne, Michigan

F-5310

★ JOB TALK ★

...About Methods

Pumpcrete Closes Diversion Tubes

CANYON FERRY DAM, near Helena, Mont., a Bureau of Reclamation concrete structure 225 ft wide and 1,000 ft long, recently had its two 10-ft dia temporary diversion tubes through the dam closed in a unique way.

Closure of the tubes was begun by sliding reinforced concrete gates down guide slots to seal the upstream ends of the conduits. At the opposite ends, prefabricated "caissons" were placed across the outlets to keep water from rising into the tubes from downstream. A small opening was left in each bore so workmen could enter.

After all water had been pumped out, a Pumpcrete machine was set up, delivery pipe run through the openings and the diversion tubes plugged with pumped concrete.

Plywood Forms Hold Bridge Pier Concrete

To save the cost of building cofferdams for concrete bridge piers, Mannix, Ltd., of Canada, recently made octagonal forms of ¾-in. waterproof plywood. The forms were devised during construction of a low-level bridge in northern Quebec.

Joints were sealed with sash cord

(Continued on page 12)

NORTHWEST

—*Its own best salesman!*

When you have equipment that you are confident will handle the unusual jobs, smoothly—with ease and speed—you know you can lick the ordinary jobs without delay or trouble.

Over the years Northwests have been developed to do the out-of-the ordinary! Here's a job, a rock job, digging footings for dam construction. This Northwest Pullshovel is handling the excavation with exceptional accuracy (note the marks on the dipper arm).

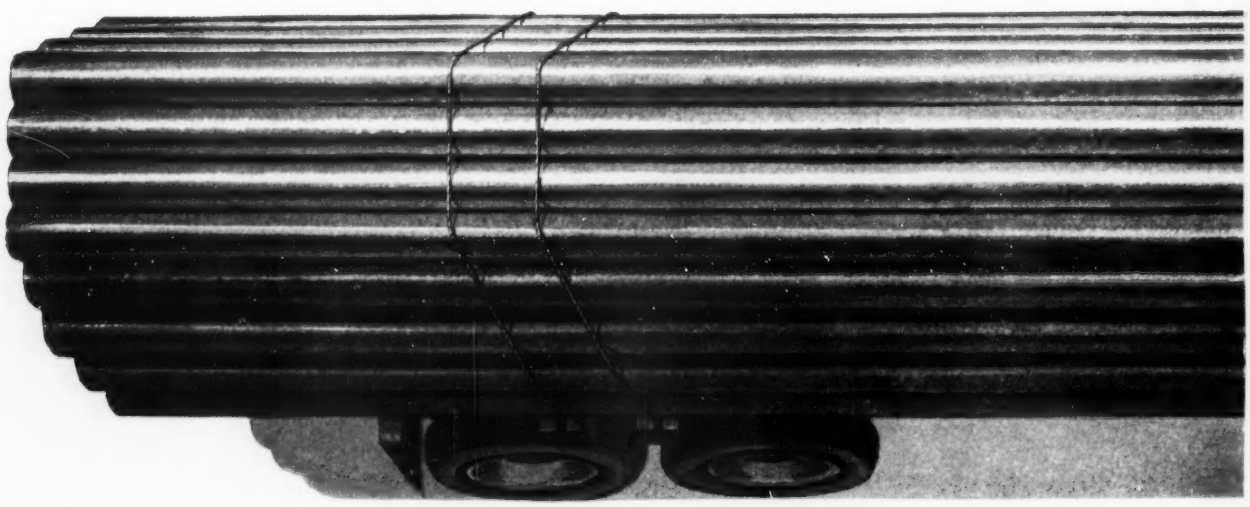
It takes smoothness of control. The Northwest "Feather-Touch" Clutch Control gives you that without the complications of pumps, valves or compressors. It takes smoothness of travel. Northwest gives you that with positive traction on both crawlers while turning as well as when going straight ahead. It takes smooth swing! Northwest gives you that with Uniform Pressure Swing Clutches. These and many other Northwest advantages combine to do the ordinary or the out-of-the ordinary job better and faster. A Northwest is its own best salesman.

NORTHWEST ENGINEERING CO.
1502 Field Building • 135 South La Salle Street
Chicago 3, Illinois

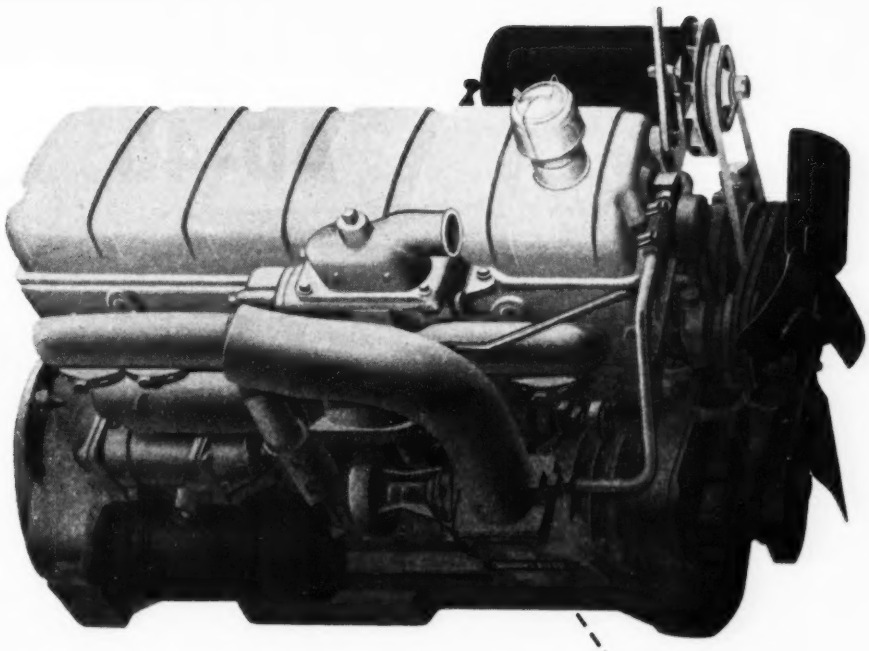
SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

If you operate medium heavy-duty trucks ...

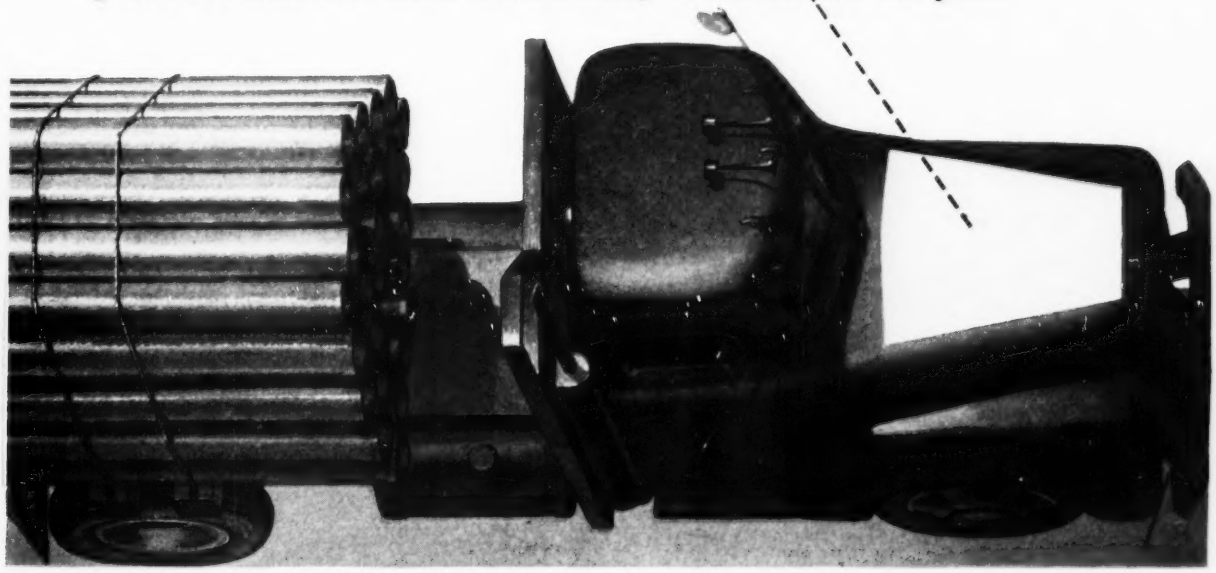
This new 150 h.p. diesel <u>now</u> makes Cummins



CUMMINS



performance and economy available to you



It's Cummins new Model JBS-600—ready to serve in the medium heavy-duty trucks produced by leading manufacturers. Ready to bring to this field the performance that has made Cummins the leader among high-output diesels. 150 h.p., the JBS-600 delivers full rated power for faster acceleration . . . for reserve stamina when the going is tough.

JBS-600 operators report more miles per gallon . . . lower fuel costs. This demonstrates the fact that Cummins' exclusive fuel and injection system—together with four-cycle operation and use of inexpensive Number 2 diesel fuel—naturally leads to savings on the job. The JBS-600 is ready to work profitably for you. It's Cummins-engineered for a long and useful life.

For all the facts—see your Cummins dealer!

Cummins® Engine Company, Inc. • Columbus, Indiana

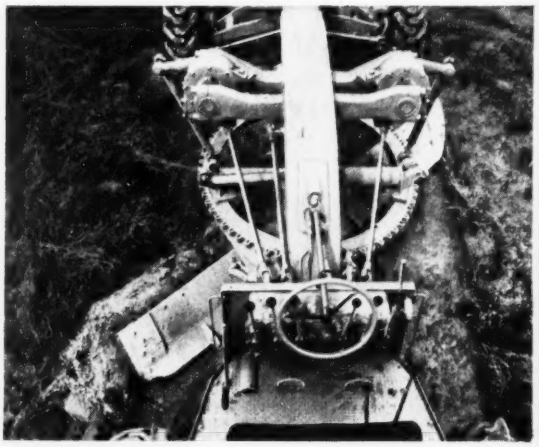
Leaders in rugged, lightweight, high-speed diesel power

ALLIS-CHALMERS INVITES YOU TO . . .

Look at Your Grader Jobs

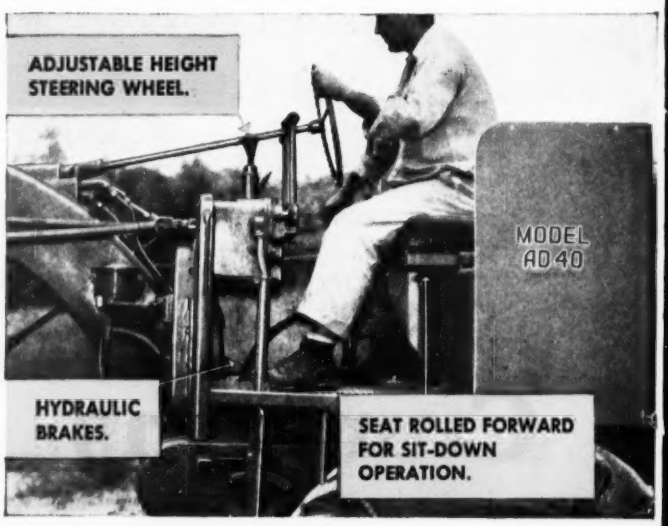
THROUGH THE EYES OF AN **AD-40** OPERATOR . . .

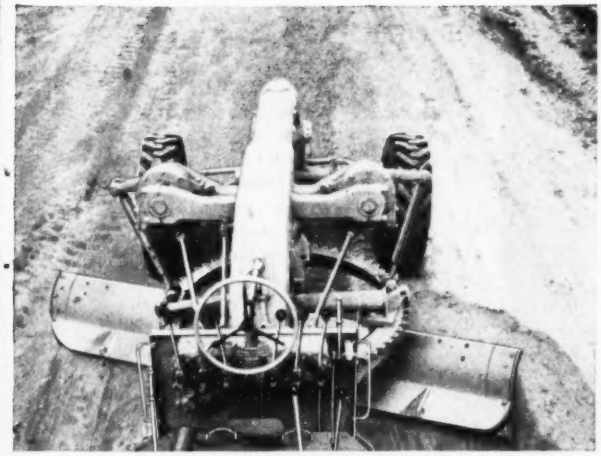
SLOPING— Look how much better you see . . . how much steadier your blade is with small control rods leading out to lift cases located directly over the circle.



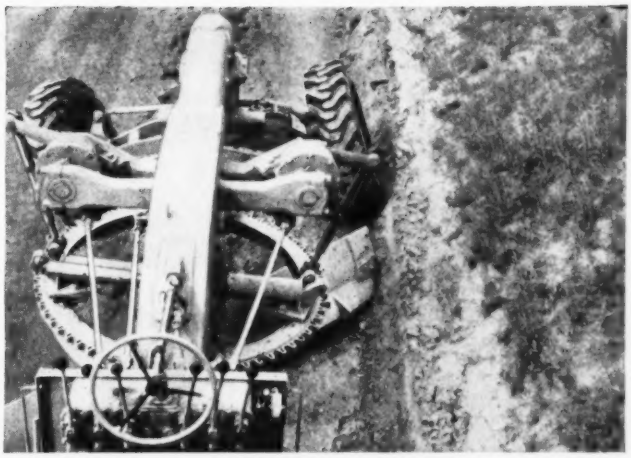
SOD STRIPPING — Look at the tapered corners on this clean, wide platform . . . how they give unequalled view of heel of ROLL-AWAY moldboard.

In addition to letting you see better, the AD-40 offers feather-touch hydraulic power steering, hydraulic brakes . . . and true comfort for any size operator, sitting or standing. *Look!*

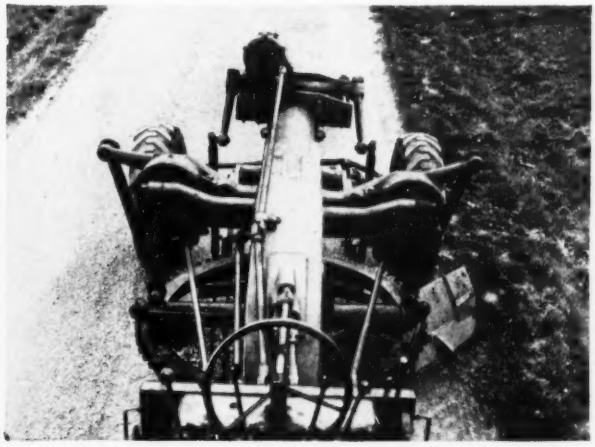




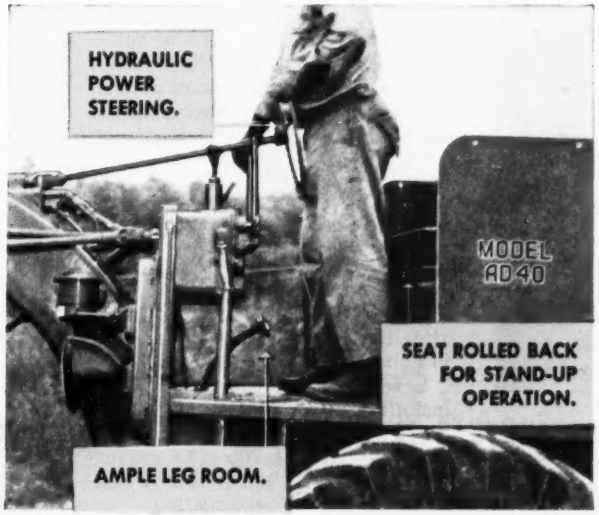
GRADING — Look at that single member frame — it really lets you see what you're doing . . . means efficient grading on *any* job.



DITCHING — Look at the low control panel. It gives you a clear view of the blade . . . helps insure a clean, smooth ditch.



SCARIFYING — Look at the AD-40, even in scarifying, and you will see it means new, better grader visibility at all times.



• 104 bhp. • Six speeds forward, three reverse
• 23,000 lb. (with optional calcium chloride solution in rear tires — 24,800 lb.).

YES, the big, new AD-40 is designed for today's jobs and today's operators . . . brings new standards of performance to all users of motor graders . . . handles all grading jobs faster, better, easier. You owe it to your operators . . . and yourself to ask your nearby Allis-Chalmers dealer now for a demonstration and *see for yourself.*

ROLL-AWAY is an Allis-Chalmers trademark.

ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE, WIS., U.S.A.

New Way to Reduce Sling Costs 22.3%

Notice how Pin-Lock Thimbles are held securely in position by steel pins. These pins make it easy to transfer Pin-Lock Thimbles to replacement Red-Strand Slings.

Save by reusing Pin-Lock Thimbles on Red-Strand Braided Slings

Now . . . *stop* discarding still-good sling thimbles! With Red-Strand Braided Slings, you simply transfer *reusable* Pin-Lock Thimbles from one sling to another. *Cut costs substantially.*

Savings of 22.3% are typical. See chart at left for other examples.

Pin-Lock Thimbles also guard against unexpected damage to sling loops. They're made of extra heavy, extra durable cast steel.

You save still more because Red-Strand Slings are made of higher-than-rated quality Leschen wire rope—famous for longer-than-expected service.

Doesn't this suggest checking Red-Strand Slings *right now?*

See your LESCHEN representative or write for folder, "NEW IDEAS in Slings."

HERE'S HOW MUCH YOU SAVE WITH Red-Strand SLINGS AND Pin-Lock THIMBLES	
Sling Size	**% Savings**
9/16" x 10'	33.0%
1/2" x 10'	23.6%
1/2" x 20'	17.2%
3/8" x 8'	22.3%
1/4" x 5'	15.5%
3/16" x 8'	13.0%
3/32" x 10'	8.5%

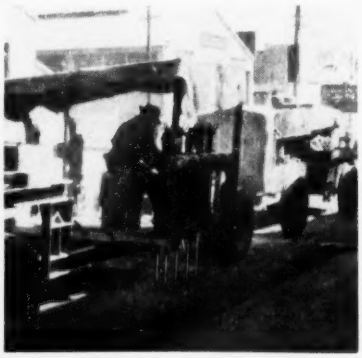
LESCHEN

LESCHEN WIRE ROPE DIVISION • **ST. LOUIS 12, MISSOURI**
The Watson-Stillman Company
(A SUBSIDIARY OF H. K. PORTER COMPANY, INC.)

JOB TALK . . . Continued from p. 6

and pitch. Forms were set on solid rock in river bottom and plumbed and lined on stilts, no attempt being made to seal form to rock. Concrete was tremie-poured until the bottom of the form began to fill.

It was allowed to set one day, then water was pumped out and piers poured in the dry. Specifications did not permit the whole pier to be tremied. Water depth averaged 10 ft. Reinforcing steel was set and tied to hoops circling the forms internally. The steel acted as a handy form tie and gave ready access to the bottom of forms.



Drills on Low-Bed Cut Pavement Strips

Comfort and speed merge for the benefit of the drill operator above and his contractor boss. Five Gardner-Denver pneumatic drills are mounted over one side of a lowboy trailer behind an International truck tractor. A Gardner-Denver 500-cfm compressor is towed behind to furnish the air.

This rig was built by Charles L. Harney, Inc., San Francisco paving contractor. It drills a series of holes in a straight line, and the ripping up of old pavement becomes almost a matter of merely "tearing along the dotted line."

Wide-Mouth Pipe Ends Reduce Erosion

New Jersey Turnpike maintenance men ran into troublesome erosion on slopes and shoulders after the road was in service, due to abnormally heavy rains.

Severe gullying was corrected by installing some 7,800 ft of 12- and 15-in. coated Armco corrugated metal pipe. Pipe spillways were installed at points where water col-

(Continued on page 30)

TERRIFIC!

NEW! SAFETY SWITCH in handle shuts machine off automatically when operator releases grip.

NEW! BALL THRUST BEARING at top of handle makes trowel adjustment easier when machine is operating.

NEW! Whiteman MODEL "J1" FLOATING-FINISHING MACHINE

NEW! BRIGGS & STRATTON 4-cycle air-cooled engine. Easy, quick starting, automatic lubrication, economical operation.

NEW! TIMKEN BEARING equipped gear case. Smoother, more efficient operation, less wear.

NEW! RUBBER COLLAR around base protects trowel adjustment arms from concrete.

NEW! BALL THRUST BEARING in base further facilitates adjustment of trowel pitch with machine in motion.

Climaxing 14 years of pioneering, manufacturing and improving concrete Floating-Finishing Machines, Whiteman proudly presents the new Model J1, the finest ever built. Faster, more efficient, it incorporates many valuable improvements, *plus* the time-tested exclusive features that have made Whiteman the World leader... "snap-on" trowels for floating, centrifugal clutch which tightens belt automatically and trowel-pitch adjustable with machine in motion. Summed up, it means smoother, easier operation and longer life. Send for catalog today!

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THE LEADER IN CONCRETE EQUIPMENT

WHITEMAN MFG. CO., DEPT. C
3249 Casitas Ave., Los Angeles 39, Calif.
Please send prices, literature and name of distributor for ☐ Screeding Machines, ☐ Power Buggy ☐ Floating Finishing Machines.

Name_____

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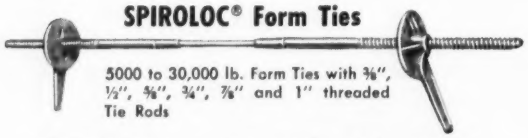
UNIVERSAL CONCRETE FORMING EQUIPMENT

a complete line from 1 Source

SPIROLOC® Form Ties

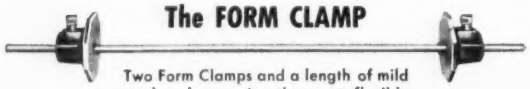


5000 to 30,000 lb. Form Ties with ⅜", ½", ⅝", ¾", ⅞" and 1" threaded Tie Rods

SPIROLOC Form Ties with CONE NUTS

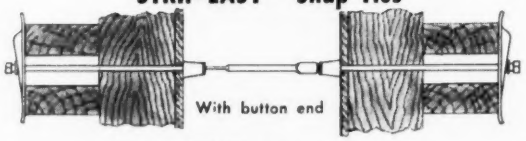
The only Form Tie with an absolutely positive spreader

The FORM CLAMP



Two Form Clamps and a length of mild steel rod comprise the most flexible Form Tie

"STRIP-EASY"® Snap Ties



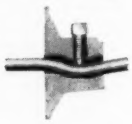
With button end

TWISTYE® Snap Ties

With loop end

The FORM CLAMP SURE GRIP Principle

Tremendous holding power is provided — assures tight forms



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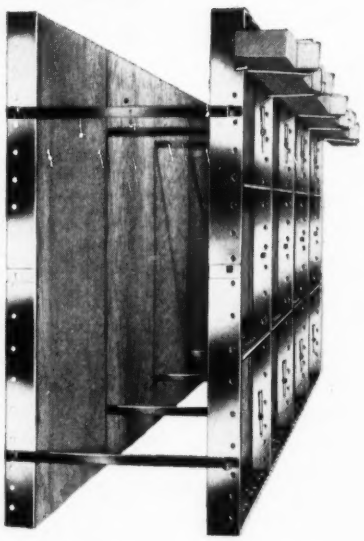

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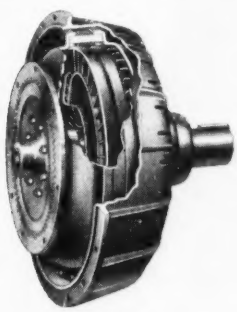
How Hydraulic Coupling Works in a Power Shovel

The hydraulic coupling type of power take-off has been proven over the years to add greatly to shovel-crane performance and life. It absorbs the impacts and shocks of hard digging, thereby reducing strain and wear on cables, machinery and engine, and it prevents the engine from stalling under any digging or lifting conditions — which is a time-saving, machine-saving feature. These many advantages are readily acknowledged by most shovel-crane men, but even some of those who like what a hydraulic coupling does for them, find it difficult to understand just how it works.

It is a load limit clutch that efficiently transmits full engine power



under normal conditions but "slips" when a shovel dipper, for example, is "hung up" on an immovable rock. This allows the engine to continue to develop full torque, with no abnormal strain on it, the machinery or cables. There is no shuddering to a standstill with stalled engine and the immeasurable strain this puts on the whole machine, as encountered with a friction type of take-off.

Even with a mechanical, band type of slip clutch, which is meant to provide shock relief, a maximum point of shock must be reached first before it becomes operative and is released. On the other hand, the hydraulic coupling has an infinite number of points of release, so to speak, which come into operation before the point of shock or overload is reached and not after. There is no surface friction, no mechanical wear, no overheating of parts. While it is mounted directly on the engine drive shaft, its "cushioning" effect would be as great no matter where it was located in the power train. It absorbs shock in both directions from itself thus giving protection from the dipper teeth to the engine. However, placed where it is, it acts on all phases of operation — hoist, swing, travel, crowd and retract.

(Advertisement)

This 2-yd. Lorain-820 digs tough limestone and dolomite at France Stone Co., Sylvania, Ohio. Lorain Hydraulic Coupling pays off on tough digging like this.

SMOOTH is the word when it's a *LORAIN-820* in rock!

Your eyes and ears can tell you what a beating your shovel takes in rock. It's a tough life — full of sudden shocks and impacts — that only the best design can withstand.

You will see a big difference in Lorain-820 shovel performance . . . the difference made by the use of Lorain's Hydraulic Coupling. This efficient fluid drive *smooths* out the shocks and impacts, *cushions* them before they have a chance to wrack and strain turntable mechanism and cables. Lorain's steady power keeps "hanging on" until the most unyielding rock is in the dipper — the toughest digging cannot stall the engine. Available air controls and air assist of crowd and travel operations make the operator's job smooth and easy. The net result — more rock in the trucks at the end of the day!

See a Lorain-820 in action. Ask your Thew-Lorain Distributor to show you the "smoothest" rock shovel you can buy.

IN ROCK YOU'LL GAIN WITH

THEW LORAIN® 820

THE THEW SHOVEL CO.
Lorain, Ohio

HOW CONTRACTORS* SPEED ON CHIEF JOSEPH

...with TEXACO SIMPLIFIED LUBRICATION

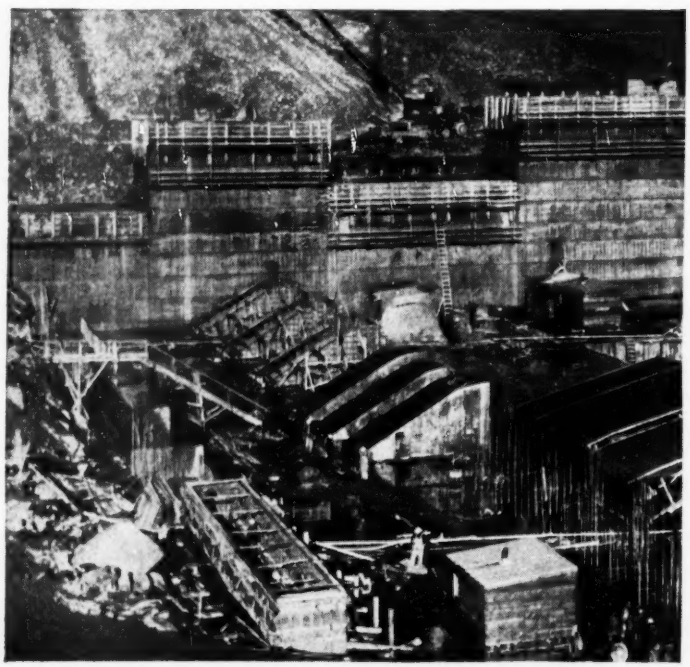
CHIEF JOSEPH BUILDERS,* a combine of four principal contractors, is doing the construction work for Chief Joseph Dam proper. In addition to a vast amount of heavy construction equipment—bulldozers, scrapers, trucks, shovels, etc.—the project involves tremendous cableways, one of the biggest refrigerating plants in the Northwest, a giant gravel crushing plant, and much more besides.

All this equipment and machinery is lubricated exclusively with Texaco. The Texaco Lubrication Engineer servicing this project worked out for the Chief Joseph Builders a Simplified Lubrication Plan – by which all major lubrication is handled with only six Texaco Lubricants.

"The Texaco Simplified Lubrication Plan," says Chief Joseph Builders, "has been a big help to us. By reducing the number of lubricants we have to use, we have substantially reduced the chance of error in application, and have speeded our maintenance work. And, of course, the always-fine quality of Texaco Lubricants has been an important factor in keeping our equipment on the job and our maintenance costs low."

Let a Texaco Lubrication Engineer work out a Texaco Simplified Lubrication Plan for *your* next project. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.



TEXACO

WORK DAM

*
THESE ARE
THE CHIEF JOSEPH
BUILDERS

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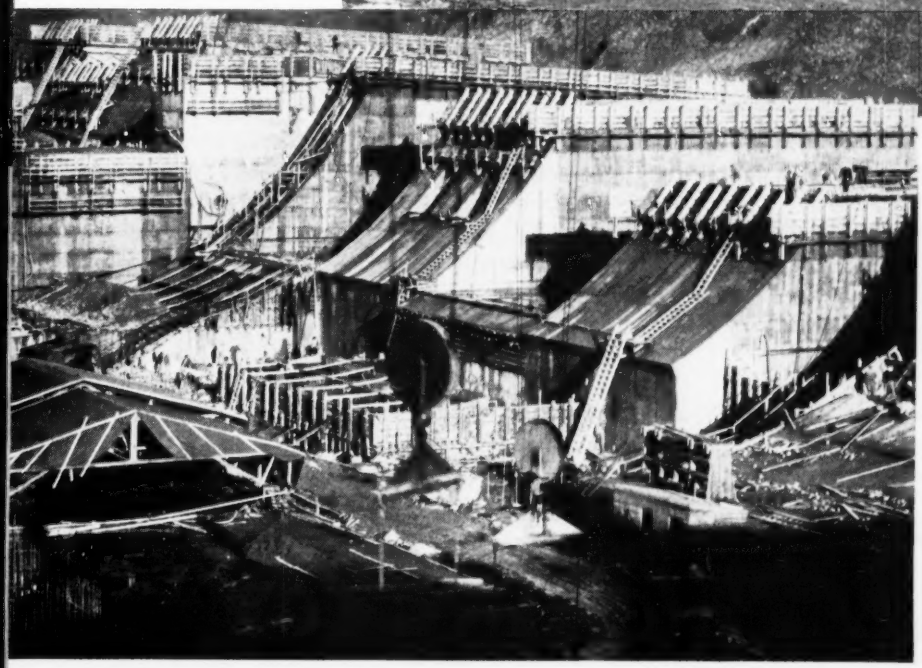
L. E. Dixon Company,
San Gabriel, Calif.

The Hunkin-Conkey
Construction Company,
Cleveland, Ohio

American Pipe &
Construction Company,
Los Angeles, Calif.



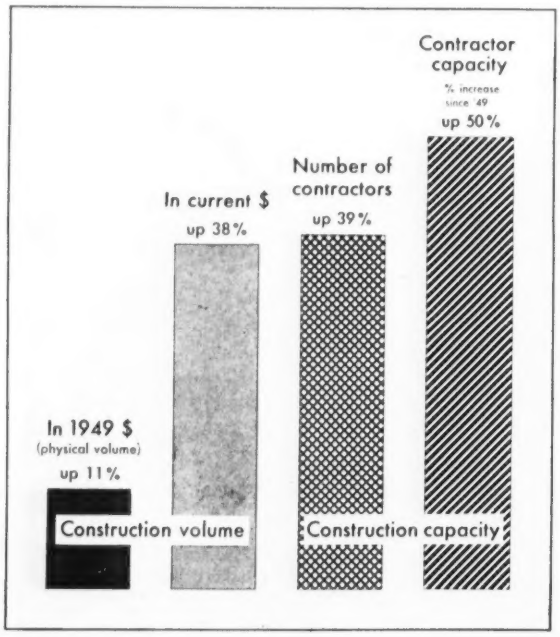
▲ THIS IS only a tiny part of the vast quantity of equipment used on the Chief Joseph Dam project. All of it is lubricated exclusively with Texaco.

◀ CHIEF JOSEPH DAM at Bridgeport, Washington, is just below Grand Coulee Dam on the Columbia River. When completed it will have a power generating capacity second only to Grand Coulee itself. The dam takes its name from the famous Chief Joseph of the Nez Percé Indians. Picture shows cableway placing in stilling basin.

Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

It's Your Business . . .



Contractors Raise Capacity Faster Than Engineers Call for Bids

CITING MORE EQUIPMENT, better supervisory personnel, more working capital and better equipment as the principal reasons, 626 contractors report that their capacity to handle heavy construction has increased 50% since 1949.

In addition, 39% more contractors in 1952 took contracts for new work than were on record in 1949.

While this two-way stretch in construction capacity was building up, the heavy construction contracts available increased only 38% in dollar value.

Some of this capacity-increase was in inflated dollars. So . . . to be realistic, let's deflate back to 1949-dollars. On this basis, physical construction volume was 11% higher in 1952 and contractor capacity was about 21% higher.

Contractors of all sizes have contributed to this increase, and this is how they say they did it:

	ALL REPORTING	BY SIZE OF CONTRACTOR IN NEW CONTRACTS PER YEAR		
		$1,000,000 or more	$300,000-$1,000,000	$100,000-$500,000
This many contractors:	626	149	106	371
. . . have higher $ Vol capacity.	87%	88%	91%	85%
. . . can handle more jobs	90%	92%	89%	89%
. . . can handle larger jobs	92%	93%	89%	92%
. . . can complete jobs faster	69%	70%	69%	68%
. . . say these factors helped boost their capacity:				
—more equipment	80%	81%	80%	79%
—more qualified supervisory personnel	63%	66%	62%	61%
—more working capital	63%	62%	63%	64%
—better equipment	54%	58%	61%	51%
—more field units	37%	42%	44%	33%
—stabilized labor following	21%	19%	20%	21%
—better supply, flow of materials	14%	14%	11%	14%
—more efficient labor	13%	7%	15%	15%
. . . say these factors limit capacity:				
—shortage of labor	19%	13%	21%	20%
—waits for material deliveries	19%	23%	19%	17%
—shortage of engineers	16%	14%	18%	16%
—shortage of qualif. supervisory personnel	8%	10%	8%	7%
—shortage of working capital	4%	1%	3%	5%

Percentages are of total number reporting in each group.

Carry-over Funds Add to New Federal Appropriations

The new look in Federal construction requires a double take this year. Appropriations for fiscal '54 total $2.14 billion. This is a staggering 74% drop from fiscal '53, concentrated mainly in the Atomic Energy building program and in air-base construction.

The second look, however, shows that carry-over funds from earlier appropriations will support a construction volume close to this year's rate. For instance, Atomic Energy Commission, with $3.3 billion appropriated last year for a 3-year program, spent only $1.1 billion on construction and equipment. This year it asked for, and got, only $166 million, but will spend an estimated $1.4 billion for structures and equipment.

For air-base construction, an estimated $1.7 billion is available in carry-over funds.

And Reclamation, with $116 million appropriated, will have carry-over funds to support a $172 million construction year.

Army Engineers Civil Functions, however, had only $12.5 million in carry-over, and the new appropriation will not provide for new starts on projects not now under way.

TVA gets $188 million this year, but carries over a big slice of last year's $336 million.

Hospital construction by the Veteran's Administration gets $38.7 million to add to its $20-million carry-over.

Federal aid was cut least: airports, 3%, to $22.7 million; roads, 7% to $475 million.

For the complete score turn to page 20

CAT* **power** helps Farnsworth stay ahead of schedule on Memphis sewer project

R. P. Farnsworth & Co., of New Orleans, has a $1,500,000 contract for laying a 60-inch main sewer, 10 miles long, for the City of Memphis, Tennessee. Average depth of the floor line is 20 to 30 feet, and the soil is largely gumbo.

Though the contract calls for completion in 1955, the company expects to finish ahead of time. Says Superintendent Thomas B. Sellers, Jr., "We have a lot of Caterpillar equipment, and it's good equipment. It stands up well and can be depended on."

There are three excavators on the job, all powered by Cat Engines. A D17000 swings the boom of a Lima 3½-yard dragline, a D13000 powers a Lima 1½-yard clamshell, and in a Kochring 1-yard dragline there's a Cat D318. In addition, Farnsworth uses three Caterpillar track-type Tractors and a No. 12 Motor Grader. There are definite advantages in standardizing on the big yellow equipment. Simplified maintenance, operator familiarity, and fast parts and repair service from a single dealer—all contribute to more production with less down time.

Fuel economy is an added benefit. The D17000 Engine, for instance, delivers an honest 200 HP on intermittent duty. Like all Caterpillar Engines it operates on low-cost No. 2 furnace oil without fouling, even at idling speeds.

Leading manufacturers can supply Caterpillar power in their equipment. For replacement engines see your Caterpillar Dealer. He has 12 sizes available up to 500 HP; electric sets to 315 KW.

Caterpillar Tractor Co., Peoria, Illinois.

CATERPILLAR*

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SPECIFY CAT POWER FOR HIGH-PROFIT PRODUCTION

certified
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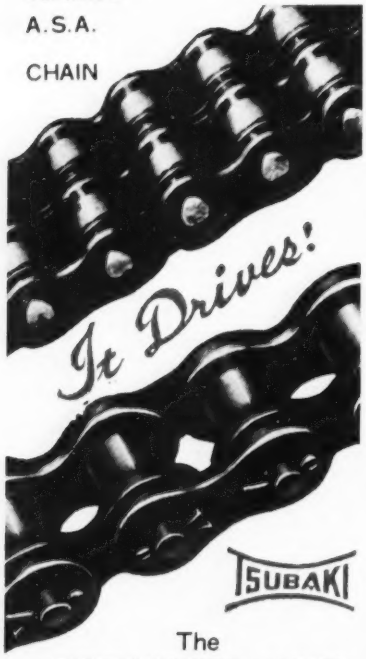

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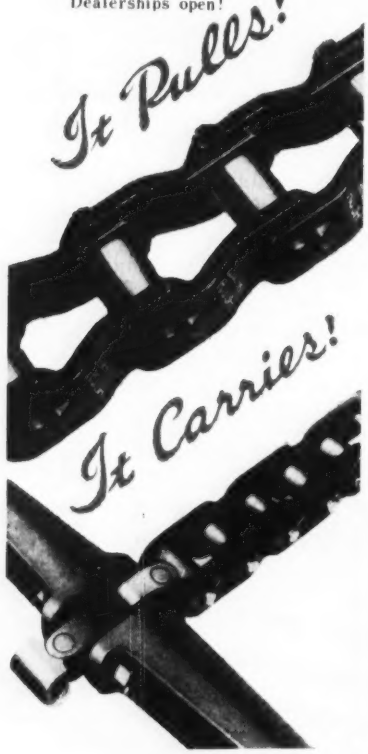
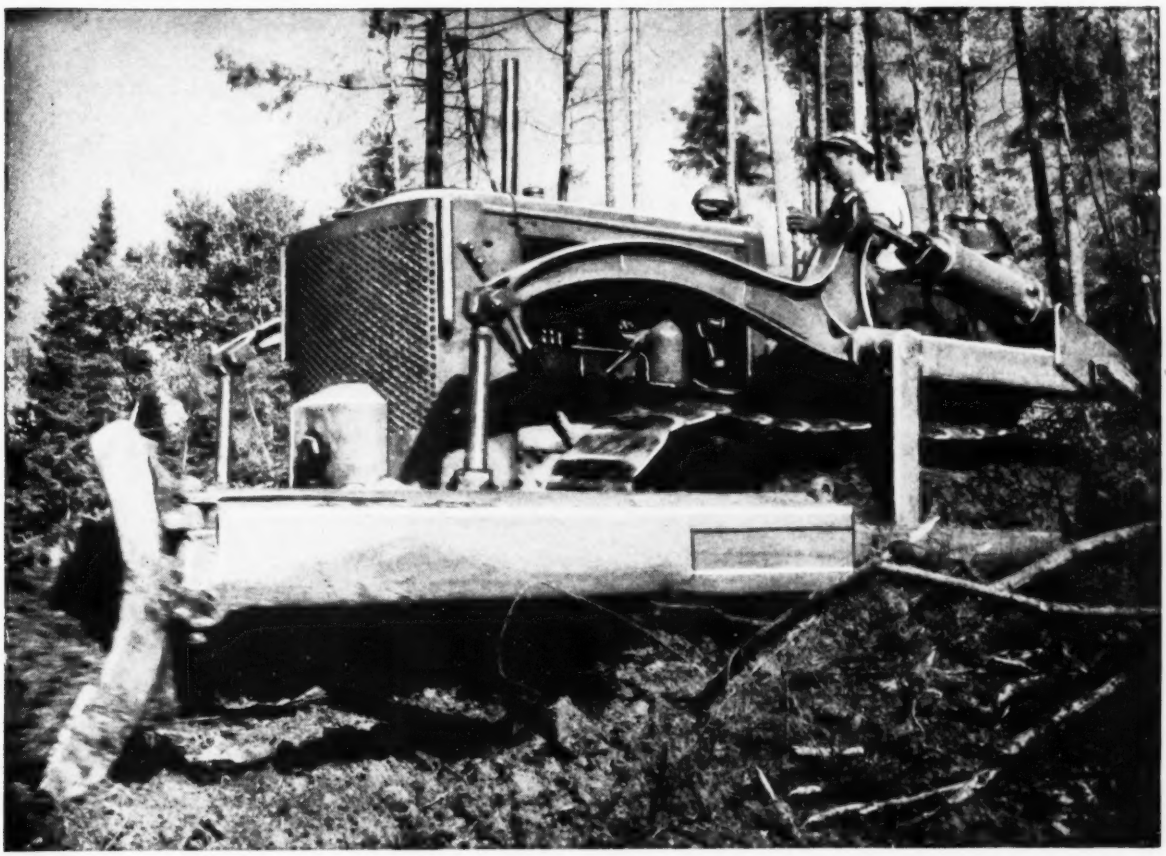


Here's the Lineup of U. S. Appropriations

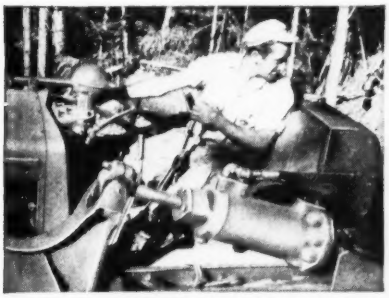
FOR CONSTRUCTION IN FISCAL '54

	(Millions) Fiscal '54	Fiscal '53
ALL CONSTRUCTION	**$2,141.7**	$8,223.3
MILITARY CONSTRUCTION		
Air Force—air-base construction	**240.8**	1,245.3
Army—military bases	**0**	586.9
Civilian components	**9.1**	20.0
Navy—Bureau of Yards and Docks	**0**	363.3
Civilian components	**30.0**	0
Secretary of Defense—military construction	**0**	140.0
ARMY CIVIL FUNCTIONS		
Rivers and harbors & flood control	**287.7**	501.5
Mississippi R. flood control	**51.4**	60.3
Other civil functions	**0**	4.2
INDEPENDENT OFFICES		
Atomic Energy Commission	**166.0**	3,327.5
TVA	**188.4**	336.0
VA hospitals	**38.7**	117.5
NACA	**11.4**	17.7
HHFA slum clearance & urban development	**20.0**	8.0
Defense Housing	**0**	32.5
Gen'l Services Adm.—Public bldg. service	**99.4**	116.8
American Battle Monuments	**8.5**	45.0
INTERIOR		
Reclamation	**116.3**	181.8
Bonneville Power Adm.	**38.9**	66.5
Alaska—public works	**12.0**	13.2
Roads	**14.6**	17.0
Railroad	**4.2**	3.9
Virgin Is.—public works	**1.0**	2.6
Bureau Indian Affairs	**15.9**	17.0
National Park Service	**15.4**	15.0
Other Interior	**30.7**	37.6
COMMERCE—BUREAU PUBLIC ROADS		
Federal aid highways	**475.0**	510.0
Forest highways	**15.0**	18.0
Access roads	**5.5**	28.0
Grade crossing elimination	**2.2**	0
Public lands highways	**1.8**	0
Inter-American Highway	**1.0**	1.0
Rama Road, Nicaragua	**1.0**	0
COMMERCE—CAA		
Federal aid airports	**22.7**	23.3
Washington Nat'l Airport	**0.4**	0.03
COMMERCE—Other	**1.2**	0.1
LABOR, HEALTH & WELFARE		
Hospital construction	**84.7**	134.7
School construction	**70.0**	195.0
Other	**4.4**	16.2
AGRICULTURE		
Forest roads and trails	**14.5**	16.0
Flood control	**5.0**	7.8
STATE		
International Boundary & Water Commission	**6.6**	13.7
JUSTICE		
Federal Prison System	**0.2**	0.8
LEGISLATURE		
Capitol arch	**1.3**	0.07
DISTRICT OF COLUMBIA	**28.8**	21.5

(For "Big Jobs of the Month," turn to p. 22)



BESIDES CUTTING OUT ROADS, Riendeau uses his TD 14 to push his truck and a 15-ton load through quagmire road sections.



RIENDEAU HANDLES BULLDOZER HIMSELF. He says: "I've had first-hand experience with the terrific performance these highest quality Cities Service Products deliver."

New Hampshire Logger Cuts Truck Roads Through Forest!

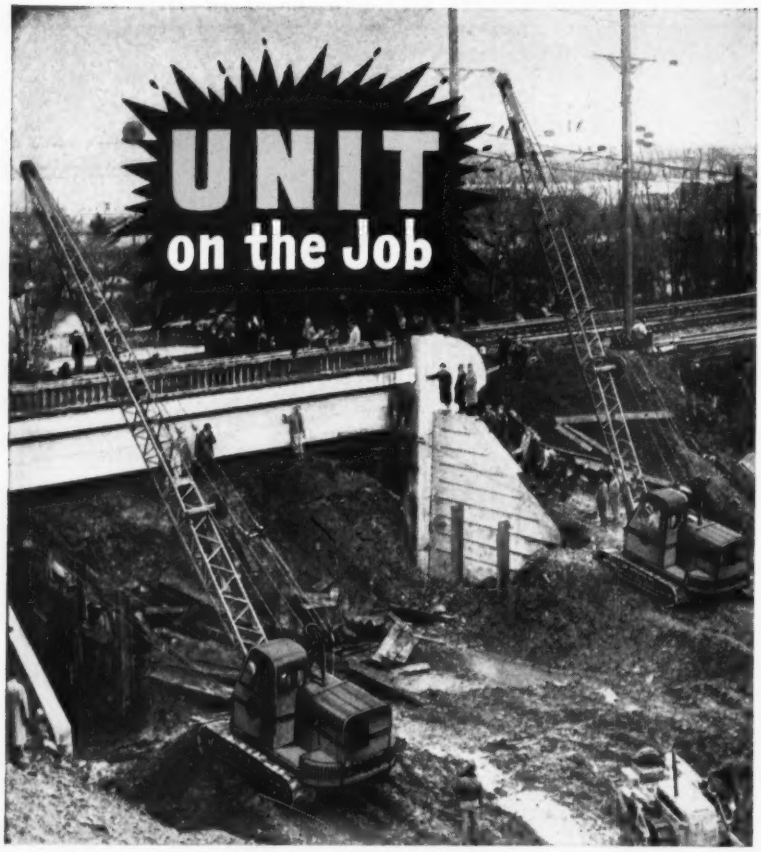
Oscar Riendeau of Berlin, N. H., has been hauling logs for about 15 years. To get his lumber out of densely overgrown New England forests, Riendeau has to cut his own truck roads. He carves out his twisting, turning truck roads with an International TD 14 Diesel . . . powered by Cities Service #2 Diesel Fuel! . . . lubricated with Cities Service Lubricants!

Says Riendeau: "I use Cities Service Products throughout my operation . . . diesel fuels, lubricants, gasolene, and even tires. These high quality, dependable products have kept my equipment at work full time under really rugged conditions. I heartily recommend them for any earth moving or trucking operation."

Why not try Cities Service Fuels and Lubricants in your operation?

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS



TEAMWORK and Accurate Control

Working as a team, these two UNIT 1020 Cranes moved a 500 TON railroad bridge from its temporary mounting to the new structure in a period of thirteen (13) minutes. This type of job calls for smooth and accurate control of boom and hoist line operation. UNIT'S extra long crawlers, multiple-hinged shoes, wide axles, and hook rollers provide perfect balance and stability. This, together with the FULL VISION CAB for complete visibility, makes UNIT the machine that is dependable and safe to handle efficiently any type of heavy-duty work.

SEE FOR YOURSELF: *Let us send you our novel TV Brochure. It illustrates the complete UNIT line.*

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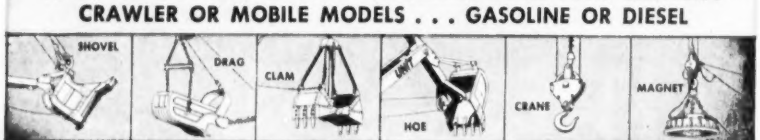
½ or ¾ YARD EXCAVATORS...CRANES UP TO 20 TONS CAPACITY
CRAWLER OR MOBILE MODELS . . . GASOLINE OR DIESEL



All Models Convertible to ALL Attachments!

IT'S YOUR BUSINESS . . .

Continued from page 20

SOME BIG CONTRACT AWARDS OF THE MONTH

George A. Fuller Co., 111 Washington St., Chicago, Ill. 41-story Mid-America Home office, Grant Park, Chicago, for Prudential Insurance Co. of America, 763 Broad St., Newark, N. J., $37,000,000.

Bechtel Corp., 220 Bush St., San Francisco, Calif. Reawarded contract for power plant at Joppa, Ill. for Electrical Energy, Inc., 315 N. 12th Blvd., St. Louis 1, Mo., $159,000,000.

Horvitz Co., Midland Bldg., Cleveland, Ohio. Roadbed including retaining walls, two reinforced concrete overpasses and construction of highway bridge for west side route of Cleveland Rapid Transit system, for Cleveland Transit System, 1404 E. 9th St., Cleveland 14, $2,880,078.

Ragner Benson Inc., 4744 W. Rice St., Chicago 51, Ill. Superstructure for generating station, Lemont, Ill. for Public Service Co. of Northern Illinois, 72 W. Adams St., Chicago 3, Ill., $7,000,000.

Western Pipe Line Constructors, Inc., 311 E. 11th St., Austin, Tex. 165 mi 30-in. gas pipe line between Kingman and Flagstaff for El Paso Natural Gas Co. Basset Tower, El Paso, $8,550,000.

R. H. Fulton & Co., Box 1526 Lubbock, Tex. 252 mi. 30-in. gas line from Corona to Gallup, N.M. for El Paso Natural Gas Co., Basset Tower, El Paso, $13,080,000.

Robert E. McKee, 2708 Inwood Rd., Dallas, Tex. 8-story hotel, including swimming pool, Commerce St., Dallas, Tex. for Hotel Statler, Seventh Ave., and W. 33rd St., New York City, $15,000,000.

Nello L. Teer Co., Trust Bldg., Durham, N.C. Flood control dam and reservoir on First Fork of Sinnemahoning Creek, Cameron and Potter counties, Pennsylvania, for General State Authority, 18th & Herr Sts., Harrisburg, Pa., $6,682,570.

Farnsworth & Chambers Co., P.O. Box 74, Houston, Tex. Hospital at Macon, Ga. for the city, $4,120,000.

(More Big Jobs on page 150)

There are good reasons why more M-S-A TYPE "K" SKULLGARDS were sold this year than ever before

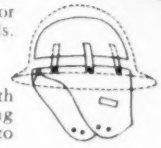
Thanks to your tremendous demand for M.S.A. Type "K" Skullgards, our mass-production hat operations are, as you can see from the picture, moving "on the double."

PROTECTION is reason number one for this ever-increasing acceptance. Reinforced high-strength, one-piece laminated plastic is more than a match for a multitude of head hazards. Special contour design provides maximum deflection. COMFORT is all-important, too. Workers like the perfect balance, light weight, self-ventilating features.

Write now for complete information.

M.S.A. WINTER LININGS

ZIPPER TYPE—Covers head, neck and ears with a skullcap and earlugs, which are joined by a slide fastener. Earlugs easily zipped in or removed. Sizes to fit all Skullgards.



TAB TYPE—Skullcap is fitted with three short tabs and a lined earlug section. Earlug section fastens to the tabs with snaps.

SAFETY EQUIPMENT HEADQUARTERS

Call the M.S.A. man on your every safety problem . . . his job is to help you

MINE SAFETY APPLIANCES COMPANY

201 North Braddock Avenue, Pittsburgh 8, Pa.

At Your Service: 76 Branch Offices in the United States

MINE SAFETY APPLIANCES CO. OF CANADA, LIMITED

Toronto, Montreal, Calgary, Edmonton, Winnipeg, Vancouver, New Glasgow, N.S.

Representatives in Principal Cities in Mexico, Central and South America

Cable Address: "MINSAF" Pittsburgh

Like all PIONEER jaw crushers, the 42" x 48" has an all-welded steel base of double-wall, box-type construction. Design reduces weight, but strength is substantially greater than is possible with a cast steel base of the same dimensions.

Hydraulic process uses oil pressure to expand inner races of shaft bearings. This permits bearings to slide freely from shaft so that bearing check-up and maintenance become relatively simple. Shaft is 10' long, 14½" in diameter between bearings. Shaft stroke is 1¼".

Giant New Jaw Crusher Rated to Deliver Over 600 TPH at 13" Setting

Workmen are dwarfed by the 19,000 lb. pitman and 5200 lb. shaft assembly being lowered into place as PIONEER assembles the world's largest overhead eccentric jaw crusher. This 42" x 48" crusher reduces rocks in a 4 cu. yd. crushing chamber at a calculated capacity of over 600 tph with maximum jaw setting of 13". Minimum setting is 4". Length of moving jaw is 104"; stationary jaw, 90". Crusher was designed to reduce drilling and blasting costs.

Welded steel construction of the base allows crusher to be built with a total weight of less than 95,000 lbs. These features are important in preventing excessive maintenance cost: A patented closure between inner and outer bearings which makes it possible to place bearings closer together than on any other anti-friction bearing jaw crusher . . . thus greatly reducing shaft strain. Outer bearings saddle-mounted in the frame on precision-machined parts. Split-reversible jaw plates, cast from tough, alloyed manganese steel, designed to prevent cold flow and peening. Toggle plate safety device protects crusher when non-crushable material enters chamber.

Want the production reports on how this giant crusher can cut operating costs in mines and quarries?

Write now to

Pioneer ENGINEERING WORKS, INC.

Minneapolis 13, Minnesota

(SUBSIDIARY OF POOR & COMPANY, CHICAGO)

Ready to go. Giant crusher is ready for shipment to the U. S. Lime Products Corp., Las Vegas, Nevada. Two-unit base permits easy handling by standard equipment.

Ask any user about

"DIVIDEND$ UNLIMITED"

FROM *Ramset System*

FOR FASTENING INTO STEEL AND CONCRETE

Outnumbering all other makes combined by better than 2 to 1, RAMSET SYSTEM is the undisputed leader among powder-actuated fastening methods. For six years, thousands of users have proved that strong, sturdy RAMSET Tools, with many built-in features and the widest variety of Tru-Set Fasteners, pay "**DIVIDENDS UNLIMITED**," like these:

CASH SAVINGS—costs reduced from $2.53 to 24 cents per fastener . . . saved $15,000 on 50,000 fastenings . . . cut over-all cost by 87 per cent.

TIME SAVINGS—fasten 15 to 1 faster . . . cut time from 9 minutes to 58 seconds . . . get jobs completed and paid for in far less time.

WORK SAVINGS—effortless operation increases productivity without fatigue . . . lightweight, compact tools workable in tight spots . . . one-hand operation a big advantage.

WIDE UTILITY—choice of 3 RAMSET Tools, and the most versatile line of Tru-Set Fasteners, provide the right tool and right fastener for every job . . . RAMSET SYSTEM does more work than any other method.

Wherever there's fastening work to do into steel or concrete, RAMSET SYSTEM pays "**DIVIDENDS UNLIMITED**" on job after job, year after year. Call your dealer or mail the coupon for on-your-job demonstration.

Ramset Fasteners, *INC.*

Ramset Division, Olin Industries, Inc.

12103 BEREA ROAD • CLEVELAND 11, OHIO

Please send us details on use of RAMSET SYSTEM for steel and concrete fastening.

Name _____

Company _____

Address _____

City _____

CM-9

pick up bigger payloads

with "KOEHRING WORK CAPACITY"

Big payload performance of Koehring cranes and excavators can be measured very quickly. Take a look at lift capacities, for example. Obviously, the machine with the heaviest lift capacity will not only pick up larger crane loads, it also has more power and stability to increase shovel and hoe production — handles bigger dragline and clamshell buckets on a wider work range.

Be sure to check lift ratings and other clear-cut measurements of "KOEHRING WORK CAPACITY" before you buy any crane or excavator. See your Koehring distributor for all the facts.

KOEHRING COMPANY Milwaukee 16, Wis.

Subsidiaries: JOHNSON PARSONS • KWIK-MIX

compare for yourself

KOEHRING MODEL	SIZE DIPPER	KOEHRING LIFT CAPACITIES (Crawler ratings based on 75% of tipping load. Rubber-tired machines —85% of tipping load)		Other lift capacities
205 CRAWLER	½-Yd.	20,000 lbs.	30-foot boom at 10-ft. radius	
304 CRAWLER	¾-Yd.	27,800 lbs.	35-foot boom at 12-foot radius	
304 RUBBER-TIRED	¾-Yd.	50,000 lbs.	30-foot boom at 10-ft. radius	
605 CRAWLER	1½-Yds.	72,300 lbs.	50-foot boom at 12-foot radius	
1005 CRAWLER	2½-Yds.	159,000 lbs.	50-foot boom at 12-foot radius	

WOULD YOU CLEAN ONLY PART OF YOUR FACE?

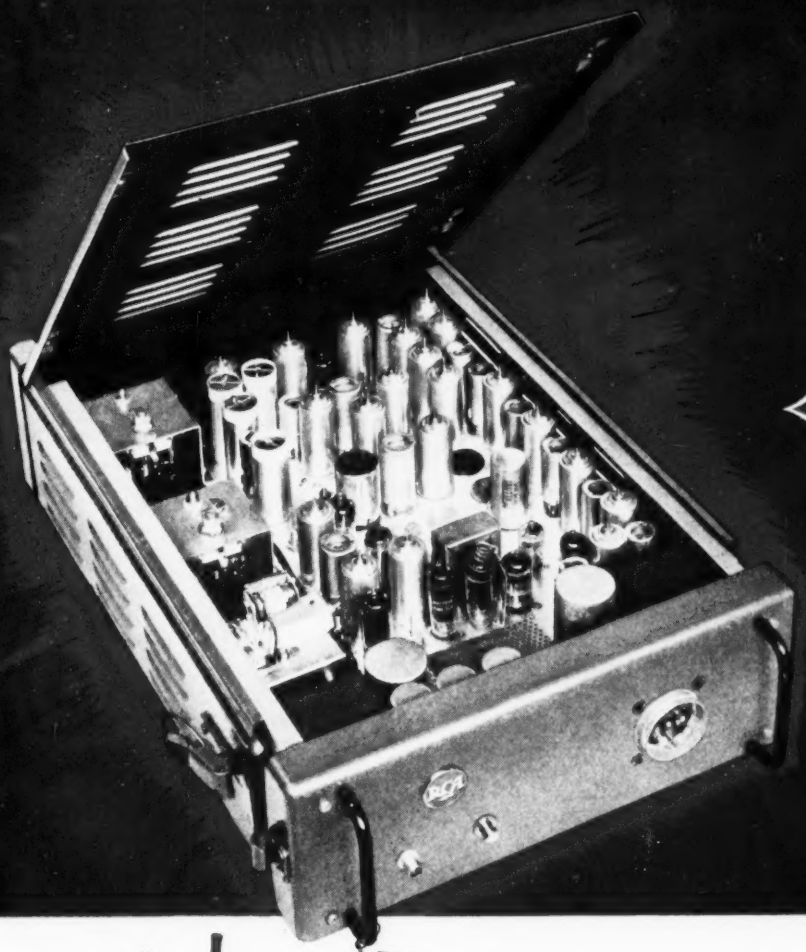
No, of course, you wouldn't! Then why clean only *part* of the oil in your engine? Why be satisfied with anything less than the best protection you can give your engine's moving parts? Keep *all* your oil clean, and all the moving parts of your engine protected, with warranted Winslow Full-Flow Filters!

WINSLOW FILTERS

Winslow Engineering Company 4069 Hollis Street • Oakland 8, California

532

Get these 7 ALL-NEW FEATURES with RCA UHF 2-Way Radio



1. Low-cost tubes.
2. Improved coverage in city areas. Less noise, less absorption of signal.
3. High-efficiency power supply.
4. Optional operation on as many as four frequencies.
5. Built-in metering sockets to speed service.
6. 6-inch antenna to simplify installation.
7. "Split" drawer design for easy maintenance.

NEW RCA UHF 2-WAY RADIO

opens up traffic-free channels

PERMITS "UNCROWDED OPERATION"

IF YOU'VE been putting off 2-way radio . . . if you're now operating on an overloaded frequency . . . here's RCA 2-way radio equipment which utilizes many new uncongested channels in the Ultra High Frequency Band, 450-470 megacycles.

NOISE-FREE RECEPTION

With RCA 2-way radio, you eliminate most man-made and natural electrical noise, cut out ignition interference and assure top performance in severe noise areas.

PROVED IN ACTUAL FIELD USE

The UHF equipment, engineered to highest RCA standards, has proved its merit in actual field use in five important systems. The new RCA UHF equipment is ready now to help you solve your problem of channel overloading.

FOR NEW FREEDOM in radio operations check RCA Ultra High Frequency 2-way radio. MAIL COUPON NOW.

RADIO CORPORATION of AMERICA
COMMUNICATIONS EQUIPMENT CAMDEN, N. J.

Radio Corporation of America
Communications Equipment Dept. 203U
Building 15-1, Camden, N. J.
In Canada: RCA Victor Company Limited, Montreal

Please send me information of RCA Ultra High Frequency (450-470 mc) 2-way radio.

NAME_____ TITLE_____

COMPANY_____

ADDRESS_____

CITY_____ ZONE_____

STATE_____

SWIVEL DISCHARGE CONVEYOR

Gives High Production to ANY Loading Job with the Athey 125 HiLoader

An Athey 125 HiLoader, working in hill country south of Portland, Oregon, is proving its ability to outproduce any loader on a variety of loading tasks. The 13-ft. swivel conveyor reaches straight back over the truck cab when only one lane of traffic is used. Where traffic conditions are lighter the conveyor can be swiveled to either side so two lanes are used. In either case, because the truck drives forward, truck maneuvering is eliminated and higher production is secured. On the Portland job 60 truck loads of ditch cleanings — grass, dirt, rocks and roots — are loaded in a day.

Where shoulders need build-up the HiLoader sidecasts cleanings onto the lower shoulders. The conveyor swings 45° to either side to place material exactly where needed. Accurate control of feeders and cutting edge allows operators to skim off debris, keeping rock and stone on the road surface. No follow-up cleaning is necessary. The HiLoader takes on stockpile loading duties without conversion or extra attachments.

The HiLoader *works* up 18% slopes without hesitation. A two-speed axle provides 10 road speeds to match every road condition. Rocks are handled as easily as dirt, the patented Athey full-floating feeder automatically opens its throat wider to pick up materials that stop an ordinary loader. The Swivel Conveyor, ground-gripping traction and job-matching speeds add up to *high production where other loaders can't even operate.*

ONLY

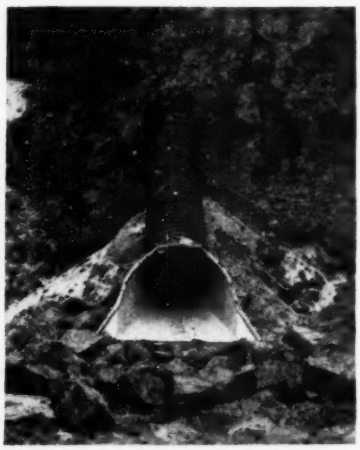
THE MULTI-PURPOSE ATHEY HILOADER CAN . . .

- Load trucks to the *rear* or to the side.
- Sidecast material to either side without moving.
- Load from stockpile without extra parts.
- Eliminate time wasted while trucks maneuver.
- Handle any material from snow to rock without attachments.
- Clean up subgrade with hauling units off the grade.
- Do 101 jobs better — and we'd like to show you how and why. Ask for a demonstration.

MORE INFORMATION?
Sure, just write for the free Hi-Loader Bulletin, just off the press . . . and ask your Athey-Caterpillar Dealer to demonstrate!

Athey
PRODUCTS CORPORATION
Dept. No. CM9 5631 West 65th Street
Chicago 38, Illinois

JOB TALK . . . Continued from p. 12



lected and were fitted with "wide-mouth" end sections on both inlets and outlets.

The enlarged end sections help to collect run-off water and disperse the flow at the outlet, reducing discharge velocity, erosion and undercutting of soil.

Gradall Lifts Out Curbstones Intact

Sawed sandstone, used as curbing along a road, is salvaged carefully for its resale value of about $2.70 a foot by the Horvitz Co., Cleveland contractors, on a road modernization job.

To remove the curb sections, Horvitz first uses a Gradall with 15-in. trenching bucket to loosen dirt along the side of the curbstones. A special tong grab, slung from the boom by a chain, lifts out curbstones intact and loads them on truck-trailers. The operation goes on at the rate of 1,000 lin ft of curb removed in a day.

PRODUCTION: **BIG**

DOWN TIME: **SMALL**

REASON: **CAT* DW20s**

Major earthmovers on this 1,800,000 cu. yd. contract at Des Moines Municipal Airport are high-speed, high-capacity Caterpillar DW20 Tractors with No. 20 Scrapers. John P. Abramson Construction Co., Des Moines, Iowa, assembled a line-up of big yellow equipment including 'dozers, DW10s and motor graders to build the 2,800-ft. extension on the northwest runway. It calls for two fills—one of 51 ft., the other of 35 ft. Superintendent Jay A. Scott reports: "Caterpillar equipment is the most standard there is—down time is small with it. We get very good service from our dealer."

Jobs like this need big producers that stay in there working—and you're looking at one in the DW20. It has a travel speed of 26.6 m.p.h., a capacity of 20 cu. yd. heaped and 15 struck, and plenty of power—225 HP at the drawbar. Cable-controlled, it loads and unloads quickly, with positive action for handling sticky materials that foul up ordinary units. Big tires float it over muddy or sandy terrain. Three-point suspension allows the DW20 to move over bumpy going with four wheels on the ground. Power-packed traction licks adverse grades. And it's a *safe* rig—operators handle it with the confidence that spells output. All these—and many other advantages—contribute to *fast cycle times.*

Make it *prove* its performance to you *on your job.* Your Caterpillar Dealer will be glad to demonstrate. Remember, he's always available for on-the-spot service. Call him today!

Caterpillar Tractor Co., Peoria, Illinois.

CATERPILLAR*

*Both Cat and Caterpillar are registered trademarks —®

**NAME THE DATE...
YOUR DEALER
WILL DEMONSTRATE**

YOU

..are the ***boss*** *of your air supply... when you use the*

GARDNER-DENVER 600

It

... stays on the site—takes no long trips to the "hospital."

... carries on without constant attention.

... keeps to your routine maintenance schedule.

... saves oil and fuel for you.

... sets close to your work—level ground or no.

Fully described in Bulletin PC-12.
Send for your copy today.

Since 1859

GARDNER-DENVER

Gardner-Denver Company, Quincy, Illinois
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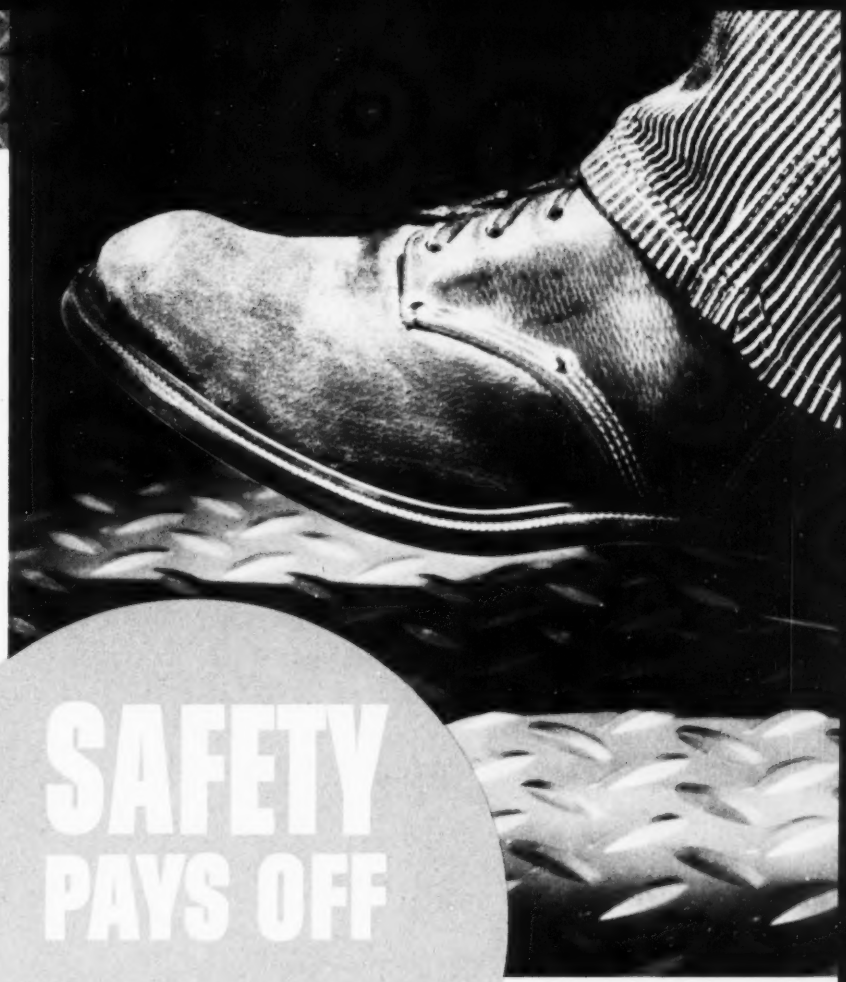
14 Curity Avenue, Toronto 13, Ontario

THE QUALITY LEADER IN COMPRESSORS, PUMPS AND ROCK DRILLS
FOR CONSTRUCTION, MINING, PETROLEUM AND GENERAL INDUSTRY



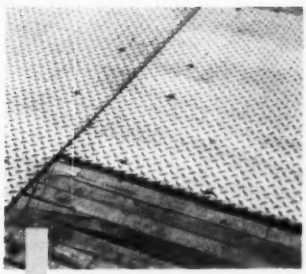
SAFETY PAYS OFF

- Save Man Hours
- Pay Lower Insurance Rates
- Enjoy Better Fire Protection
- Have Happier Employees

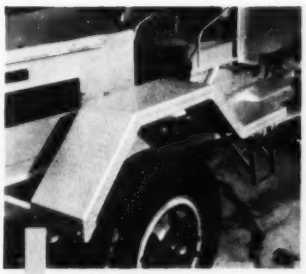
with Industries' first choice of safety flooring-

INLAND

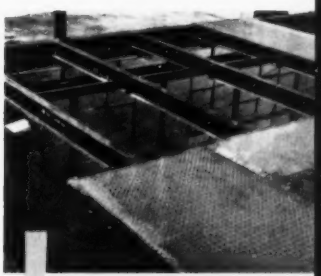
4-WAY® safety plate



for replacement



on new equipment

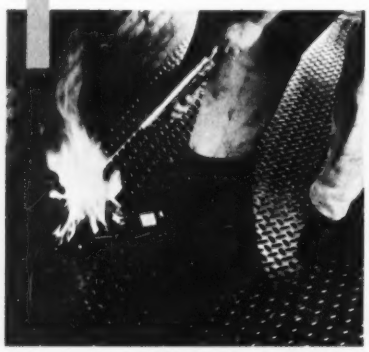


in construction

4-WAY safety plate

firesafe

4-WAY is popular as a safety flooring in plants and for product use where fire hazards are a problem. Resists intense heat and shock with ease. Eliminates fire risk, reduces insurance costs.

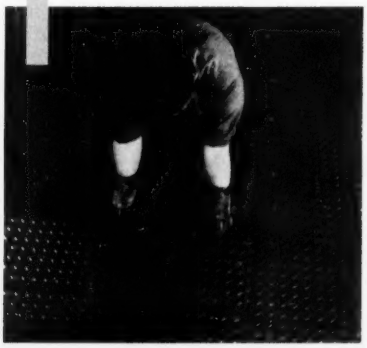


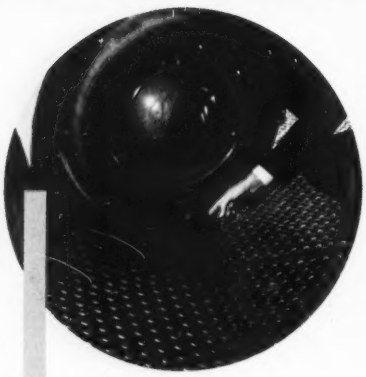
attractive

Popular demand for 4-WAY also results from its attractive appearance, eye-pleasing design. Pattern is uniform in all directions, pieces are easily matched. Looks good even after years of service.

economical

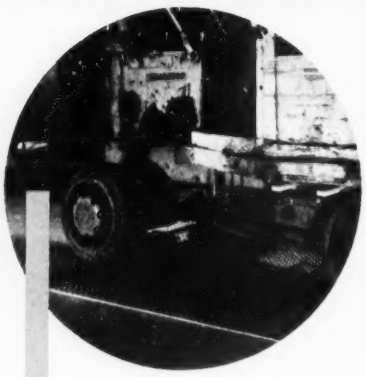
You'll be floored by 4-WAY's low cost! Initial cost is competitive with other flooring materials, installation cost may be less. Repair cost is practically eliminated. Maintenance is trouble-free.





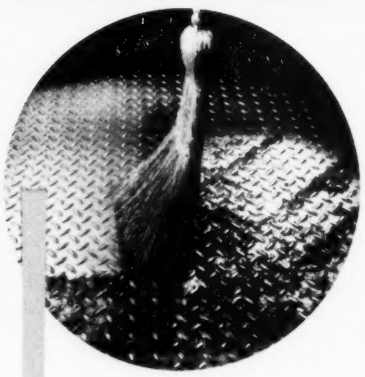
safe

Specially designed raise-lug pattern provides dependable all-weather traction for men and vehicles. STOPS and starts are made quickly, safely—*before* accidents get a foothold.



strong

Rough abuse and heavy loads are taken in stride by this tough, tried and proved steel plate. Made of finest rolled open hearth steel. Withstands great stresses.



cleans easily

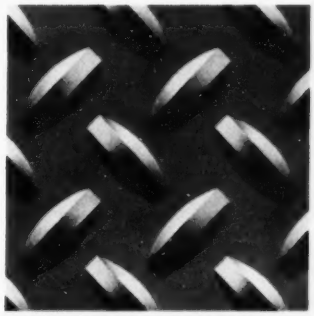
Where cleanliness and sanitation are prime factors of importance, 4-WAY provides sanitary flooring with no dirt-catchers. Liquids drain away freely, are not absorbed. (Chemical resistant.) Won't splinter, chip or crack.

there's a 4-WAY® safety plate size and pattern TO FIT YOUR NEEDS

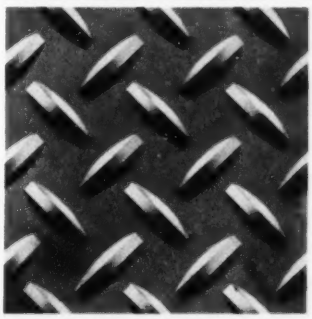
Can be . . . Flame Cut • Sheared • Sawed • Drilled and Punched • Welded • Formed • Spot Welded

Goes down fast and flat, fits snug with a minimum of preparation. You have a safe floor surface ready for instant use.

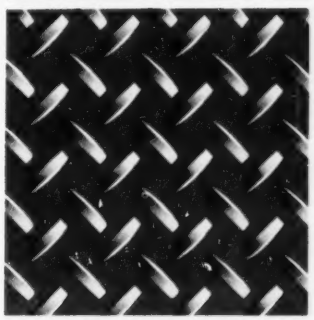
Easy to fabricate and maintain—with the strength found only in steel. These and other advantages make 4-WAY the outstanding choice of industry. See how safety pays off when you use Inland 4-WAY safety plate.



LARGE PATTERN
recommended for floors that must withstand tough abuse and heavy loads



MEDIUM PATTERN
the most popular and most versatile pattern for use in your plant or on your product



SMALL PATTERN
for applications requiring weight reduction or severe forming

(One-half actual size)

easy to fabricate

4-WAY can be fabricated by any of the conventional processes used on carbon steel plates. On-the-spot cutting, drilling or burning is readily accomplished with standard equipment.

MAIL *for more information*

CLIP THIS COUPON

INLAND STEEL COMPANY
38 South Dearborn Street
Chicago 3, Illinois

Gentlemen:

Please furnish me with the following information on 4-WAY safety plate:

☐ Catalog ☐ Availability and ordering information

Name _____ Title _____

Firm _____

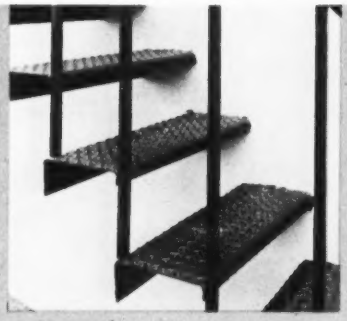
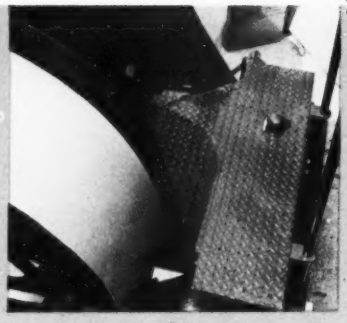
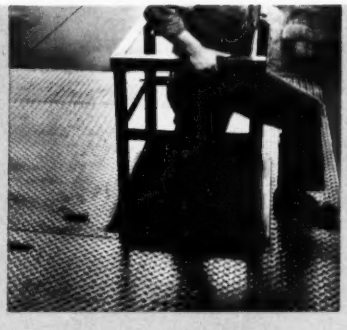
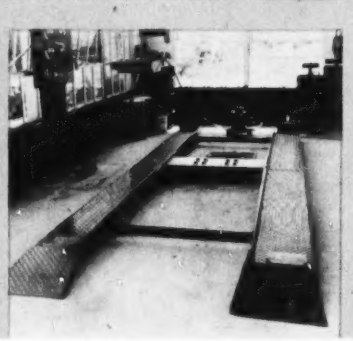
Address _____

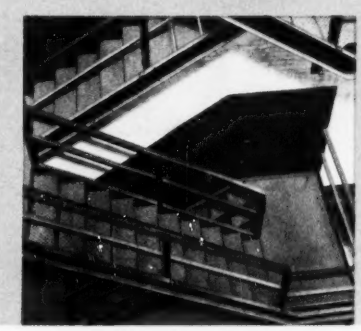
City _____ Zone _____ State _____

A B C D E F G H I

Inland 4®-WAY safety plate

PROVED IN USE



Actual use under the most trying conditions has proved Inland 4-WAY the versatile answer to flooring problems. Rugged, long lasting, it combines safety, strength, fire resistance and ease of maintenance all rolled into one. See for yourself how 4-WAY can safeguard you best and save you more. Send for the catalog that tells the complete 4-WAY story.

Stocked by leading steel warehouses throughout the U.S.A. and Canada

INLAND STEEL COMPANY

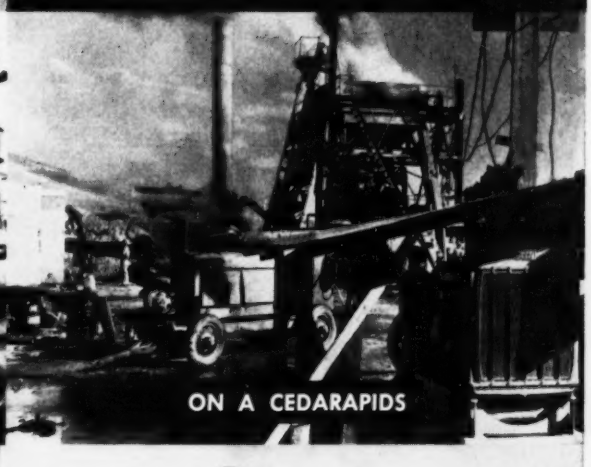
38 South Dearborn Street • Chicago 3, Illinois

Sales Offices: *Chicago, Milwaukee, St. Paul, Davenport, Kansas City, St. Louis, Indianapolis, Detroit, New York*

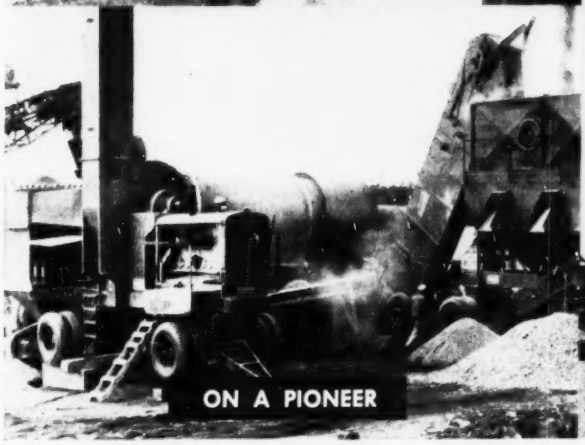
ON A HETHERINGTON & BERNER

CUT "Cost Corners" IN YOUR ASPHALT PLANT WITH MURPHY DIESEL POWER

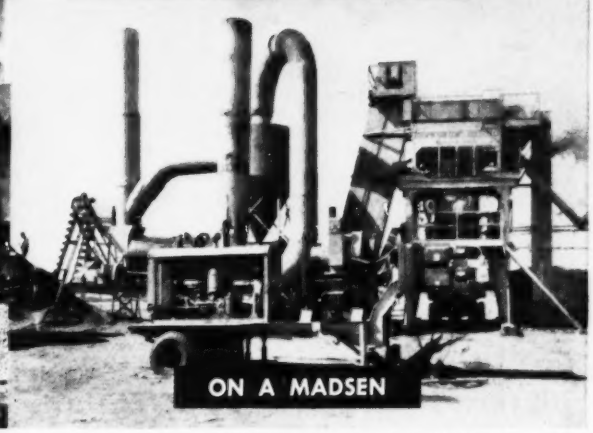
ON A BARBER-GREENE



ON A CEDARAPIDS



ON A PIONEER



ON A MADSEN

MURPHY DIESEL COMPANY • 5339 W. Burnham St., Milwaukee 14, Wisconsin

Engines and power units 90 to 240 H. P. Generator sets 60 to 140 K. W. Also Mech-Elec Units for supplying both mechanical and electrical power simultaneously or separately.

MURPHY DIESEL

273

Heavy duty power **for construction**

Murphy Diesel Engines and power units are available in sizes from 90 to 240 H.P. Engine speeds are 1200 and 1400 rpm. Also available are dual-fuel engines and altitude engines which will maintain sea level ratings up to 9000 ft. "Packaged" generating units are available with capacities ranging from 60 to 140 K.W. A.C. or D.C. voltages to suit your requirements.

Move More

These 5 great quality features tell why a MICHIGAN

1 MICHIGAN AIR CONTROL . . . *FAST, SMOOTH, POSITIVE*

The MICHIGAN Line is famous for fast, smooth swing—no jerk, no grab—with finger-tip operation. Operator stays at peak efficiency all day because air-power does the work. A minimum of dead-weight inertia; and no static friction—6 hook rollers with anti-friction bearings assure smooth, effortless swing.

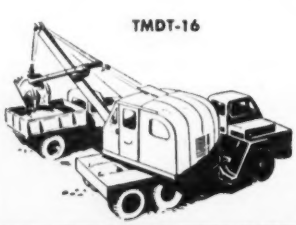
2 CIRCLE GEAR AND CENTER POST CAST INTEGRAL . . .

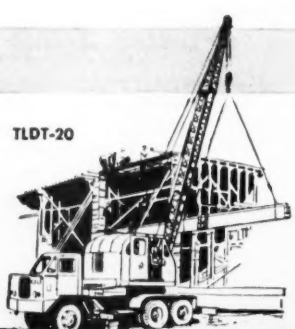
Take a good look at this—then compare it to the gear on any other machine built. See it in operation. Its internal tooth drive is inherently rugged and dependable. Hook-roller paths are cast integral and machined to a taper that matches the taper of the six rollers.

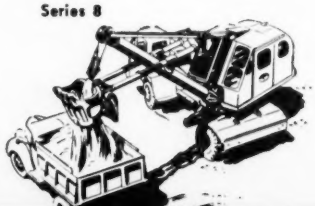
3 TURNTABLE DECK AND SIDE FRAMES CAST IN ONE PIECE . . .

Turntable shafts, ball-bearing mounted in the side frames, *can't get out of line*—eliminating a major cause of wear and replacements. That's why the turntable gives years of uninterrupted service. Hook roller mounting brackets also are cast integral with the machinery deck.

T-6-K


TMDT-16


TLDT-20


Series 8

with a MICHIGAN

"Nearly 500 yards of tough clay in 7 hours!... that's real earth moving!" *says Jim Smith, operator*

JOB	**County Road Ditch—80 rods, 8' x 6' x 3' bottom**
MACHINE	**TMDT 16—Diesel powered**
OWNER	**Van Buren County (Mich.), Road Commissioner**
YARDS HANDLED	**About 500 per day**
MATERIAL	**Clay**
FUEL	**8-10 gallons per day**
COMMENT	**"This is way ahead of former machines. Remote control is swell. Air control makes fast, easy operation. You can see what you're doing. Fine balance, too . . . " Jim Smith, operator for Van Buren County.**

Moves More Yardage faster, at low cost, dependably

4 MICHIGAN MS CLUTCH...

An exclusive advantage, entirely new—this single-disc double-faced clutch with six interchangeable segments on each face. Worn segments are easily replaceable *in the field*, in a matter of minutes—an extraordinary time-saver. A cool-running clutch, effectively ventilated, always efficient—no adjustments for temperature.

5 EXTREME EASE OF *MAINTENANCE and SERVICE*

Greasing time is negligible—a few minutes per day. Reasons:

- Anti-friction bearings instead of bushings
- Simplicity of MICHIGAN Air Control System—a single copper tube from each control valve to the clutch ram, instead of a complicated system of toggles, rods, joints, pins all requiring daily greasing.

For decisive proof that you get More for Your Money in a MICHIGAN, *see* the MICHIGAN Line in action—and check each machine, point by point, with other machines of equal capacity. See your MICHIGAN dealer—and write for literature.

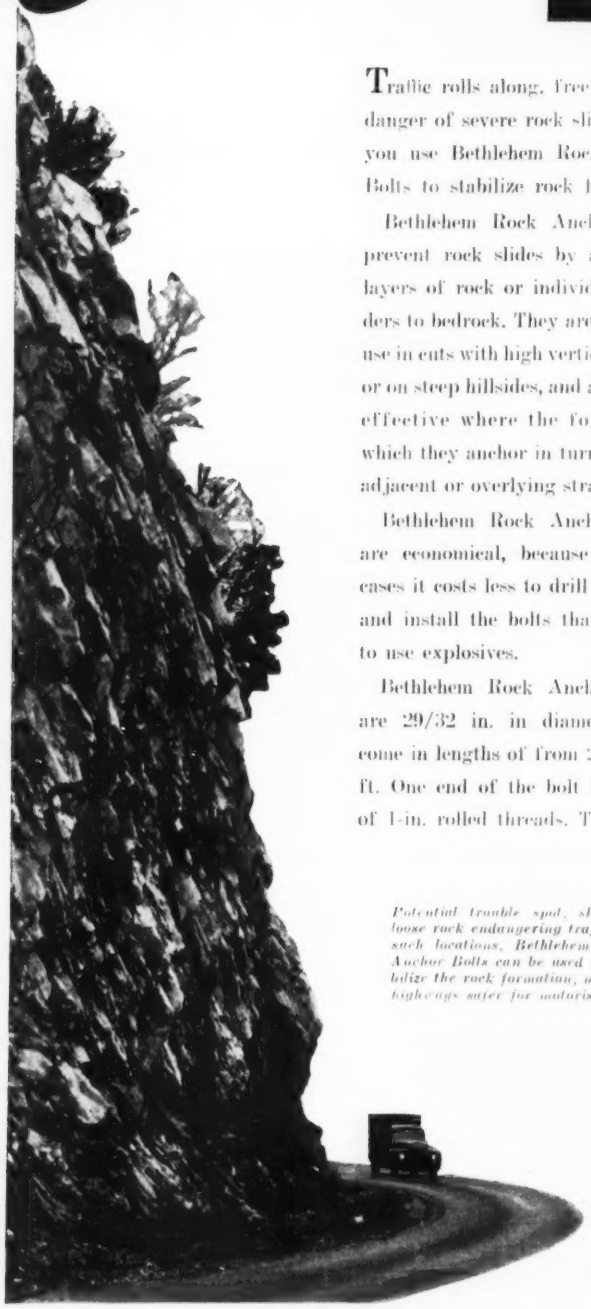
C-16

Construction Machinery Division

CLARK EQUIPMENT COMPANY

495 Second Street, Benton Harbor, Michigan, U. S. A.

ROCK SLIDES CAN BE PREVENTED



Potential trouble spot, showing loose rock endangering traffic. At such locations, Bethlehem Rock Anchor Bolts can be used to stabilize the rock formation, making highways safer for motorists.

Traffic rolls along, free from the danger of severe rock slides, when you use Bethlehem Rock Anchor Bolts to stabilize rock formation.

Bethlehem Rock Anchor Bolts prevent rock slides by anchoring layers of rock or individual boulders to bedrock. They are ideal for use in cuts with high vertical banks, or on steep hillsides, and are highly effective where the formations which they anchor in turn support adjacent or overlying strata.

Bethlehem Rock Anchor Bolts are economical, because in most cases it costs less to drill the holes and install the bolts than it does to use explosives.

Bethlehem Rock Anchor Bolts are 29/32 in. in diameter, and come in lengths of from 2 ft to 10 ft. One end of the bolt has 5 in. of 1-in. rolled threads. The opposite end has a 6-in. slot, made by an exclusive forging process which forms the equivalent of two half-rounds. The slot accommodates a wedge which, forced deep into the slot when the back of the hole is reached, spreads the bolt-end to provide a tight fit. Installation can be handled with your present equipment.

Bethlehem Rock Anchor Bolts are furnished with an American Standard Square Nut. The bolts are placed horizontally or at an angle. They may be used in combination with rock anchor ties, plate washers, and angle washers.

If you have a particularly dangerous stretch of highway which you feel may call for rock anchor bolts, write to us at Bethlehem, Pa., telling us about it. We'll be pleased to study the rock condition, and offer recommendations.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation.

BETHLEHEM STEEL

BETHLEHEM ROCK ANCHOR BOLTS

Crane operator keeps aware of job situation—gets swift instructions by 2-way Radio.

You'll Cut Costs... Bid Low... Speed Construction with Motorola 2-way Radio

Whether you're building a dam or a multi-story building, you'll do a *better, faster* job with Motorola 2-way Radio. Instant communications keeps men and machines working, eliminates lost time and mileage, reports breakdowns as soon as they occur. Motorola systems pay for themselves many times over in a short time.

Motorola gives you eight exclusive improvements for top performance and durability. The "Permakay" wave filter eliminates 15 nuisance tuning adjustments. Lowest overall maintenance costs and obsolescence-proof design makes Motorola your best value.

Let a friendly Motorola engineer in your vicinity give you the complete, money-saving story.

Write today to Dept. 2286-CM.

Central Control Console gets men and machines on the job quickly. Keeps supplies rolling, saves time and mileage through instant control of operations.

Motorola . . . Specialists and Leaders in 2-way Radio

2-way Radio

Motorola®

Communications & Electronics, Inc.

A SUBSIDIARY OF MOTOROLA, INC.

900 N. Kilbourn Ave., Chicago 51, Illinois • Rogers Majestic Electronics Ltd., Toronto, Canada

WHEN ANSWERING THIS ADVERTISEMENT, PLEASE REFER TO "ITEM 5355"

Help provide **MAXIMUM** *advantages*

On the Maxi Crane Carriers designed for loads to 30-ton and for fast travel and maneuverability, high strength Diamond Roller Chains drive both sets of wheels from the main shaft.

As with all types of heavy construction equipment, the great reserve strength and uniformity of quality of Diamond Chains are important in providing the long-life service, dependability, and continuity of operation needed to insure maximum steady output.

On the equipment you build or operate, it will pay to use the roller chain bearing the Diamond trade-mark,—the Hall Mark of Quality.

SHOT-PEENING SINCE 1944

Diamond Chain has long recognized that certain types of internal stressing of chain parts would increase fatigue resistance. To this end, link plates have been specially processed and chain rollers and other parts have been shot-peened since 1944.

• • •

Diamond Chain has improved the pin and bushing holes in the link plates by proper pitch hole preparation. Pins and bushings are case hardened.

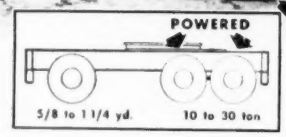
DIAMOND CHAIN COMPANY, Inc.

Where High Quality is Tradition

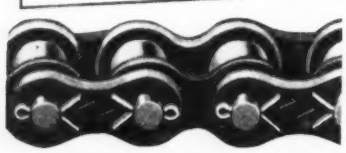
Dept. 418 402 Kentucky Avenue, Indianapolis 7, Indiana

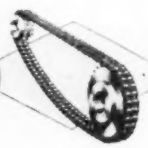
Offices and Distributors in All Principal Cities

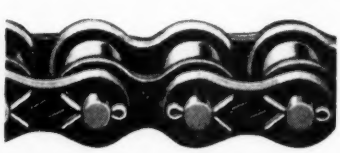
Refer to the classified section of your local telephone directory under the heading CHAINS or CHAINS-ROLLER



Above: Maxi Crane Model Carrier, made by Six Wheels, Inc., Los Angeles. Diamond Chains drive both sets of rear wheels on each side.



DIAMOND  **ROLLER CHAINS**



Here's how ROCKMASTER® reduces noise

The noise your neighbors hear . . . and complain about . . . is air blast. It is the noise of wasted explosive energy that escapes into the air before it has done its job on the burden. Such noise is difficult to avoid when holes are spaced too closely and detonation begins at the top. This waste of power occurs because the explosives force seeks the path of least resistance.

By allowing initiation at the bottom of the holes, the ROCKMASTER Blasting System can keep the explosives force under prolonged confinement . . . as shown in the above photos taken at the height of four different ROCKMASTER blasts. Each photo shows considerable movement of burden with practically no escaping gases.

To see how the ROCKMASTER Blasting System can improve your blasting efficiency and reduce noise at the same time, send for your copy of the booklet featuring the ROCKMASTER Blasting System.

The North Jersey Quarry Company erected this greenhouse at its Millington operation, 400 feet from the working face, to prove that its blasts don't break windows. The reduced noise and vibration of the ROCKMASTER *system helps them improve community relations.*

ATLAS

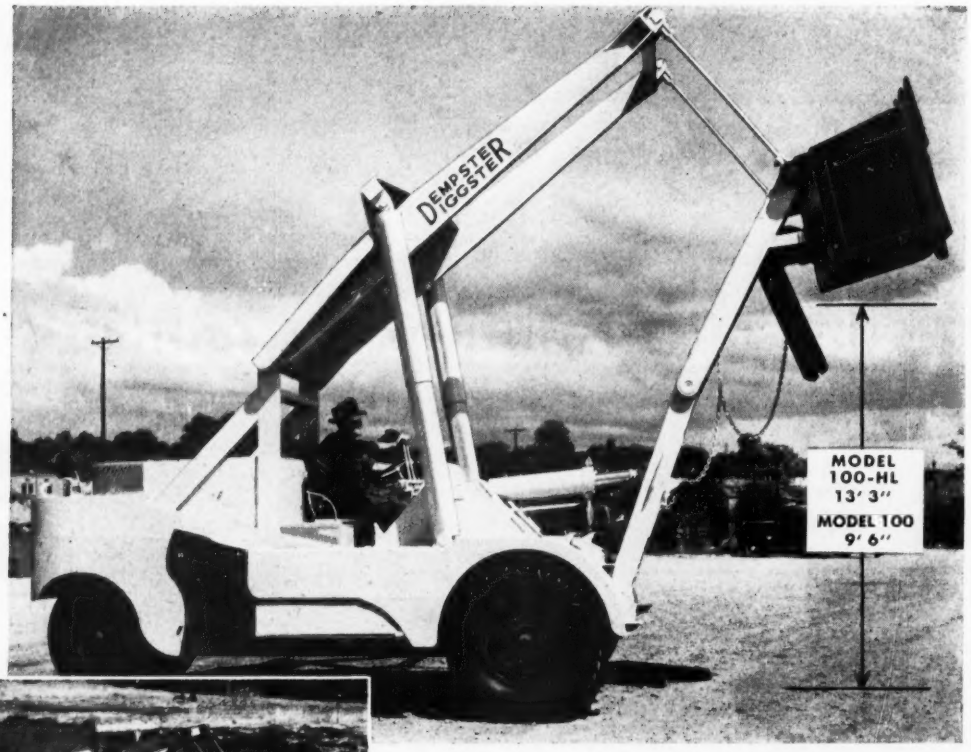
ATLAS EXPLOSIVES

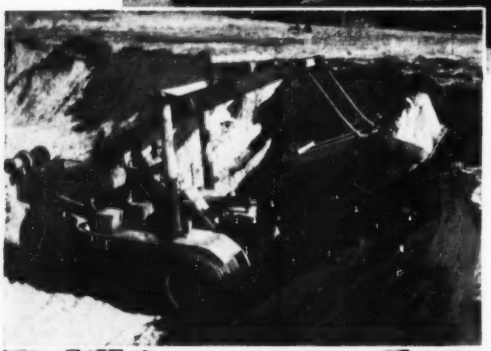
"Everything for Blasting"

ATLAS POWDER COMPANY, WILMINGTON 99, DELAWARE

Offices in principal cities

Power-Packed 100% Hydraulic Performance





Large photo shows position of bucket when at extreme height above ground. Two small photos illustrate how, in excavation or loading, bucket follows slope of material—getting a full bucket with every stroke. Dempster-Diggster digs-in 15 inches below grade and digs out a 15 to 18 foot bank.

DEMPSTER-DIGGSTER OFFERS YOU BIG SHOVEL HYDRAULIC PERFORMANCE IN A SMALL, MOBILE UNIT...

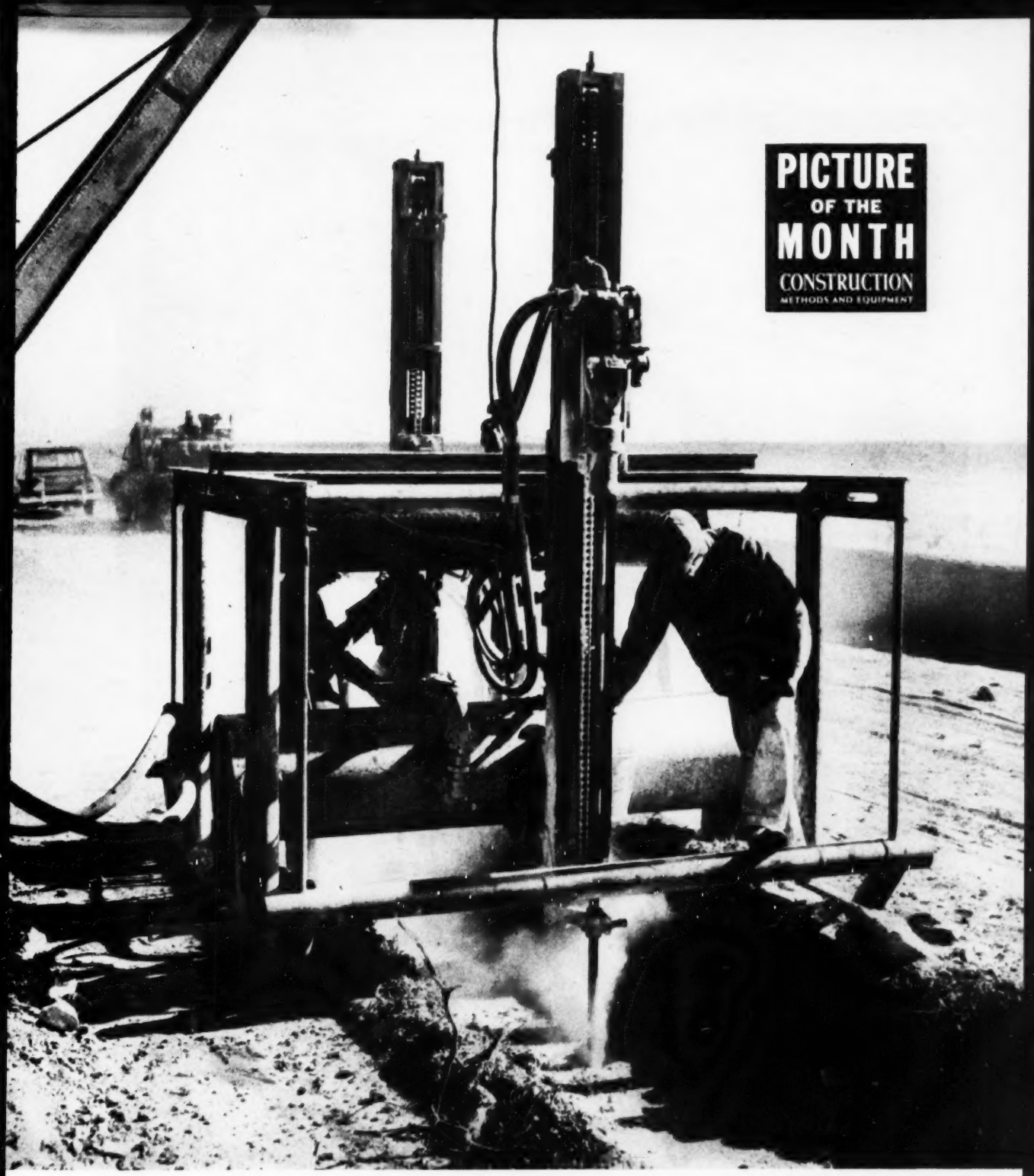
The Dempster-Diggster is the only small shovel that offers you all these basic and important features of big shovels—*Simultaneous and Independent Crowd and Hoist . . . Hydraulic Crowding . . . Hydraulic Hoisting . . . Variable Crowd Action at any Dipper Position . . . Changeable Buckets.*

With these big shovel features, plus truck speeds on the job, and to and from jobs, the Dempster-Diggster enables you to speed up production for greater profits on jobs requiring excavation or loading!

Write for complete facts on this revolutionary, power-packed shovel. A product of Dempster Brothers, Inc.

DEMPSTER DIGGSTER
TRADE MARK REG

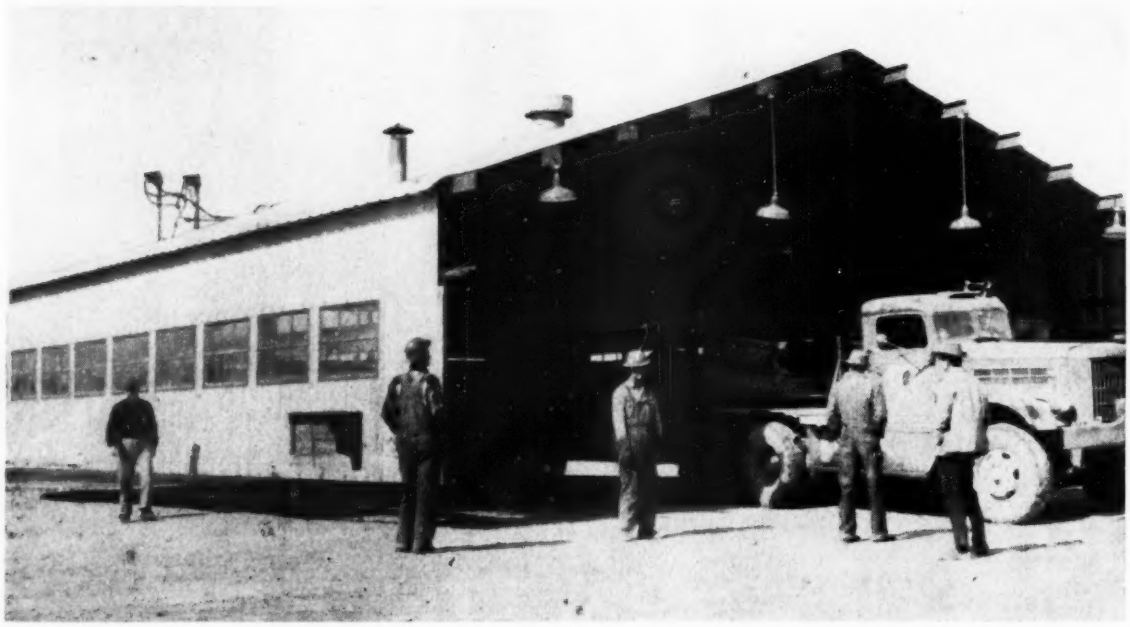
DEMPSTER BROTHERS
393 Shea Building, Knoxville 17, Tennessee



Pipeline Drill Sled

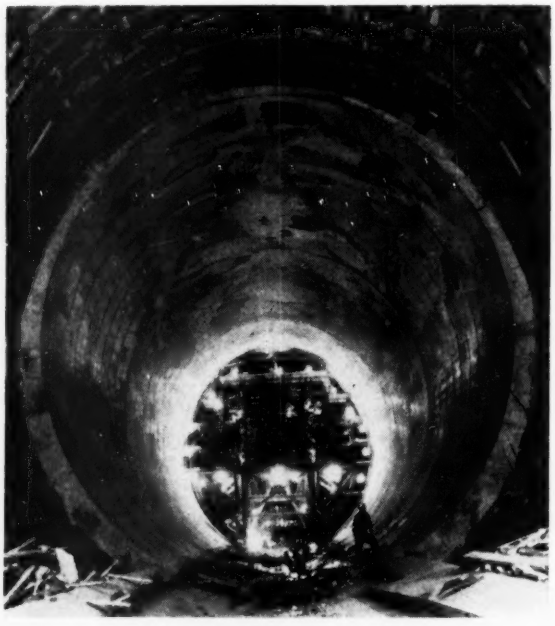
Western Texas is dry country and water is valuable. Here two Gardner-Denver Model 99 wagon drills are going strong drilling blast holes for a 90-mi water pipeline to Odessa. The sled-type drill carriage devised by the contractor makes possible staggered holes or uniform spacings. Drills are 1¼-in. Timken steel with 2¼- and 2½-in. Timken detachable bits. Holes range from 2 to 7 ft deep; trench is excavated to 5 ft. Air comes from a 500-cfm Gardner-Denver compressor, towed by a Caterpillar D8 with side boom which also moves the drill rig. Contractor is a combine of Ben Sira & Co., Dallas, and McKenzie Construction Co., San Antonio. Picture was taken by Hercules Powder Co., whose blasting products are used in the trench.

Construction News in Pictures



BUILDING ON THE MOVE — Down Paducah, Ky. way, on the Atomic Energy Commission construction job, prime contractor F. H. McGraw and Co. does things in a big way. Here a Butler steel building, measuring 60x40 ft, is on its way to a new site to keep pace with rapidly changing construction needs on the big project. The building is braced with steel members and carried on the special-built Dorsey lowboy suspended on timbers and steel H-beams. There is little disassembly, truck is loaded easily.

STRICTLY FOR FISH — Euclid trucks, Caterpillar crawler and Lima crane wade deep in ice-cold water in the Babine River of British Columbia to save a "million-dollar" salmon run. A huge rock slide had blocked the stream in a deep canyon and backed up the water to form a lake more than a mile long. The slide occurred north of Hazelton, and the Canadian Department of Fisheries built a 62-mi road to reach the site, erecting 15 major bridges and 40 small bridges and culverts along the way.

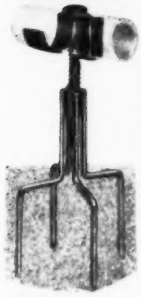


JUMBO WATER TUNNEL — A circular concrete lining 3 ft thick covers the excavated diameter of 51 ft of this power tunnel for the $300,000,000 Sir Adam Beck Generating Station under construction below Niagara Falls on the Canadian side (CM&E Feb. 1952, p. 48). In background appears the Blaw-Knox 45-ft dia steel form. This is first of twin tunnels 5½ mi long for an eventual power station generating capacity of 1,200,000 kw. The lining will require nearly 1,000,000 yd of concrete.

SUPERIOR *Adjustable* SCREED CHAIRS

Adjustable Screed Chair assembled with 1" pipe screed in STANDARD HOLDER
Adjustable Screed Chair assembled with rectangular metal screed in STANDARD HOLDER
Adjustable Screed Chair assembled with 1" pipe screed in SWIVEL HOLDER
FOR FORMED SLABS

FOR SLABS ON FILL



ADJUSTABLE SCREED CHAIR FOR FILL assembled with 1" pipe screed in swivel holder

Modernize and speed up your screeding routine by using inexpensive Superior Adjustable Screed Chairs with reuseable Screed Holders.

Durably constructed and designed to provide maximum support and adjustability, Superior Screed Chairs permit easy and quick positioning and adjustment of pipe or bar screeds regardless of deck or slab variations. There is no interference from reinforcing steel in placing these chairs and they are readily nailed to the deck if desired.

A variety of assemblies are available to meet virtually any job requirement — for formed slabs or for slabs on fill. Write for details.

For maximum efficiency, select SUPERIOR for *all* your concrete accessory requirements and be assured of the *best* in design, material, and workmanship, plus the assurance of dependable delivery. Request a copy of our new catalog 500 — it contains a valuable table for spacing studs, wales and form ties.

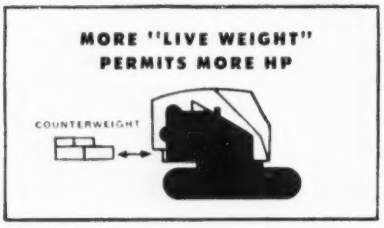
SUPERIOR CONCRETE ACCESSORIES, INC.
4110 Wrightwood Avenue, Chicago 39, Illinois
New York Office: 1775 Broadway, New York 19, N.Y.
Pacific Coast Plant: 2100 Williams St., San Leandro, Calif.

Before you buy:

COMPARE NET HP!

This LS-85, despite tough, big-chunk rock, has been operating over 1200 hours without requiring one replacement part!

Don't judge available power by engine model only ... NET hp is what adds up to extra profit!



COMPARE shovel-cranes with and without counterweight. That test spotlights the size, weight and heft built into the working parts and structural members. You'll find the LS-85 has more "live weight" than comparable ¾-yard shovel-cranes.

Greater net horsepower assures faster, deeper digging. Bigger loads are handled without stalling. For example: the diesel driven heavy-duty ¾-yard LS-85 packs 92 net hp. That's more power than comparably-sized competitive rigs can safely use. It's why the LS-85 has more digging force behind its bucket teeth . . . why it cuts so smoothly . . . hoists and swings without a pause.

Use of greater net hp is practical because of all-welded, stress-relieved construction *and extra "live weight."* This *extra live weight* is in heavier, sturdier working parts and structural members—rather than a heavier counterweight. All this means year-after-year service and low maintenance costs. So whatever you do, don't compare power by the engine model only—CHECK *NET* HP.

For more facts on the LS-85, ask your distributor, or write for Catalog 2317. For the complete line, request Catalog 2373.

LINK-BELT SPEEDER CORPORATION
Cedar Rapids, Iowa

13,248

LINK-BELT SPEEDER
CORPORATION
BUILDERS OF A COMPLETE LINE OF CRAWLER, TRUCK AND WHEEL-MOUNTED SHOVEL-CRANES

FACTORY-TRAINED DISTRIBUTOR SALES AND SERVICE SPECIALISTS ...EVERYWHERE

CONSTRUCTION 'ROUND THE WORLD

THREE NORTH KOREANS in their oversize uniforms get a good look at some big earthmoving equipment in use by U. S. troops as they Indian-file through neutral zone at Panmunjom. Area is being cleared by UN for returned prisoners.

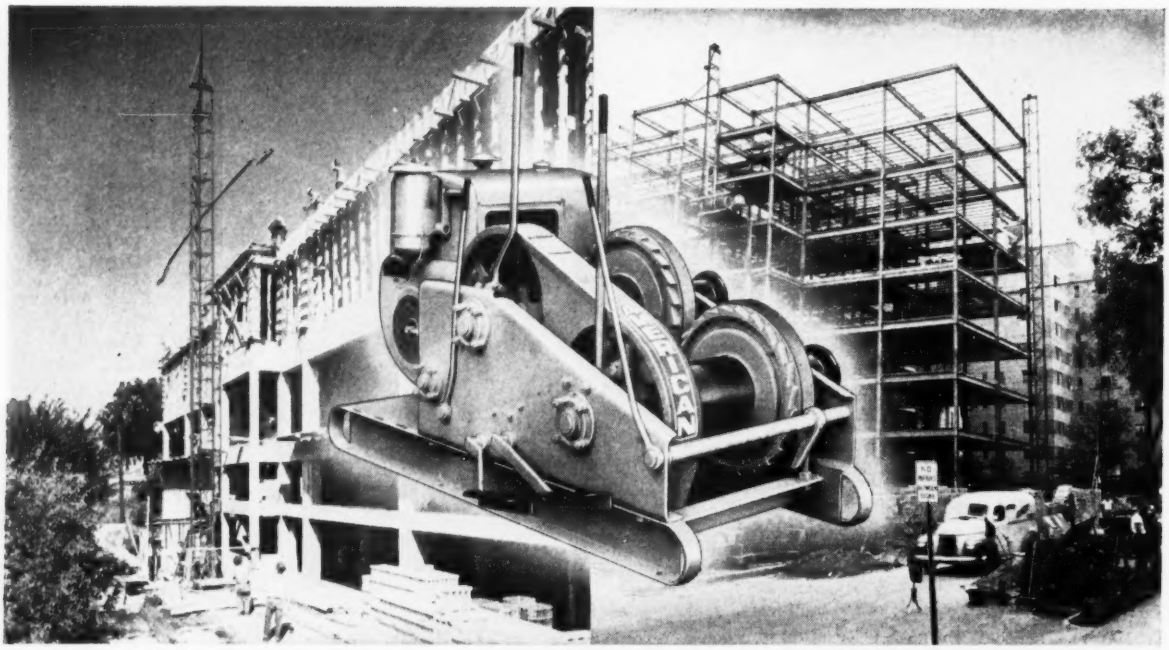
MORE NORTH KOREANS crowd muddy ditch as they excavate with hand shovels and stretcher-like slings for roadbuilding alongside. In rear is now-famous Armistice Hall under construction.—Wide World Photos

Ideologies in Sharp Contrast

COMMUNISTS do not present a convincing picture to the free nations of the world when construction methods are compared. These two photos taken in the neutral zone of Korea are dramatic proof of the large-scale production in earthmoving possible with a few husky machines.

One American with scraper or power shovel can do many times the work being put out by this ditchful of canvas-shoed North Korean laborers. Elaborate hall for signing of armistice being built by Communists in background is direct contrast to ancient roadbuilding.

NOW! Anti-friction Bearings THROUGHOUT!



Lowers Maintenance Time, Increases Production Time!

Every rotating part in the new American 25-B and 40-B Hoists runs in an anti-friction bearing! Standard, self-aligning ball bearings that make hoist operation *easier, faster, safer* because they maintain perfect drum, shaft and gear alignment.

Maintenance is cut to a minimum because all bearings are sealed, require lubrication just once a year. No more daily bearing lubrication!

Anti-friction bearings throughout is just one of the many reasons that make American Hoists *first in the field*. See your nearest distributor for complete details on the entire American Hoist line!

American Hoist

American Hoist & Derrick Co. **St. Paul 1, Minn.**

For safety... insist on

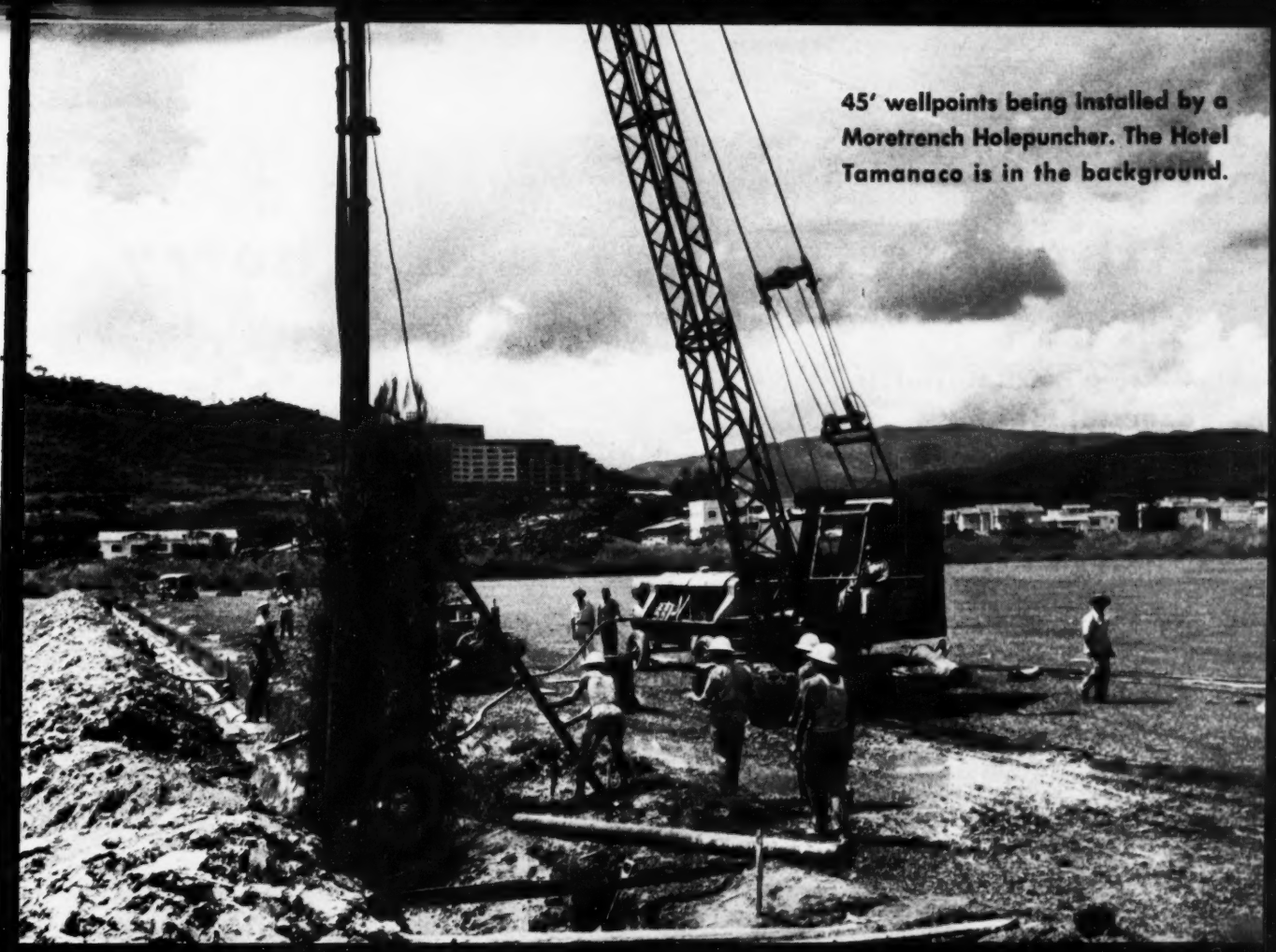
American

CROSBY

Load-Rated!

WIRE ROPE BLOCKS

NEW! SEALED, SELF ALIGNING, ANTI-FRICTION BEARINGS
NEW! STRUCTURAL STEEL BED AND SIDE FRAMES!
NEW! REMOVABLE CAST STEEL RACHET RING!



45' wellpoints being installed by a Moretrench Holepuncher. The Hotel Tamanaco is in the background.

THE WORLD'S LARGEST WELLPOINT WATER SUPPLY SYSTEM

What we believe is the world's largest wellpoint water supply system has recently been installed by Moretrench engineers in Las Mercedes, a suburb of Caracas, Venezuela.

Designed to provide 1800 GPM (115 liters per second), the Moretrench Wellpoint System draws water from the sand and gravel beds of the Rio Guaire in ample supply for the requirements both of Las Mercedes and the new luxury Hotel Tamanaco.

Low in cost, easily installed, economically operated, Moretrench Wellpoint Equipment is being used extensively all over the world for predraining wet excavations and for supplying water wherever ground water is available.

If you *need* water ...or want to *get rid* of it, call us. We can help you!

MORETRENCH CORPORATION

90 West St. New York 6 | 4900 S. Austin Ave. Chicago 38, Illinois | 7701 Interbay Blvd. Tampa 9, Florida | 315 W. 25th St. Houston 8, Texas | Rockaway, New Jersey

Canadian Representative: Geo. W. CROTHERS Limited, Toronto, Ontario

CATERPILLAR

Albeni Falls—a dam in a hurry

Off to a quick start, this dam still calls for construction speed. One of the pacemakers is CAT* equipment.

Albeni Falls Dam is unique. It was authorized, had funds appropriated, designed and started in less than one year! That was in 1950-51. It's still going strong.

The dam, in the Columbia River Basin, is located on the Pend Oreille River in Idaho, about two miles east of the Washington state line. Constructed on a granite reef, the concrete gravity dam occupies the south channel of the river. The spillway section is approximately 90 feet high and 700 feet long. A powerhouse, about 450 feet long, occupies the north channel. Hydroelectric rating will be about 42,600 KW. Total cost: $31,070,000.

One of the features of the project is the storage gained in Pend Oreille Lake, one of the largest natural lakes in the west. The lake will provide 1,140,000 acre-feet of usable water storage annually without raising the level of the lake. It will be done by retaining part of the annual spring flood waters throughout the late summer. The dam will not cause any lands to be flooded that were not flooded under natural conditions.

Clearing 800 acres of shore line and river delta, 45 miles along both sides of the Pend Oreille River, called for rugged equipment that could slug it out in the toughest kind of going. That's why Christofferson, Stakkeland and Zachery of Everett, Wash., who got the $400,000 clearing contract, depended on Caterpillar* D8 and D6 Tractors and Bulldozers. That's why they whirled through the job in 2½ months, operating only eight hours a day.

LOG CHUTE is being built in the Albeni Falls Dam by a hard-working D8 with No. 8A Bulldozer. This will make passage for logs floated down the river past the $31 million dam.

CLEARING 800 ACRES of shore line and river delta are two Caterpillar D8 Tractors with 'Dozers. Going 45 miles along both sides of the Pend Oreille River, this job was completed in 2½ months.

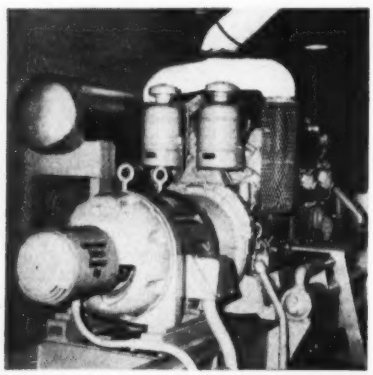
"We have used Cat products since 1939," explained Mr. Christofferson, "so we know they are good."

But there are many other pieces of Caterpillar equipment at work on the fast-stepping Albeni Falls Dam. On the shoulder of the dam, a D8 with Bulldozer is working in rough, rocky material putting a log chute through the dam. This job will make a passage for logs which are floated down the river past the dam. Another contractor—Albeni Constructors, this time—knows you need dependable equipment to stay on schedule.

And inside the dam itself there is more dependable Caterpillar equipment—a D386 Diesel Electric Set. Cat dependability is being used for standby power in case of emergency. This power-packed electric set will operate the spillway gates and de-icing mechanism during any prolonged shutdown of commercial power at the dam.

Why not ask your Caterpillar Dealer to demonstrate his dependable equipment on your job. And once you buy from him, you can be sure that you are going to get quick, reliable service around the clock.

*Both Cat and Caterpillar are registered trademarks—®



EMERGENCY POWER will be provided the Albeni Falls Dam by this D386 Diesel Electric Set. In case of power failure, it will operate spillway gates and de-icing mechanism.

CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS

Volume 35
Number 9

CONSTRUCTION
METHODS AND EQUIPMENT

SEPTEMBER
1953

Harold W. Richardson, Editor

One United Construction Union

2. What it Means to Labor

LAST MONTH on this page we proposed a single, united construction union to replace the present system of labor organization based on mechanical crafts. We advocated one big industrial-type union, with the members divided into three classes—unskilled, semi-skilled, and skilled. There would, naturally, be wage differentials from class to class, but all workers in any one grade would receive the same wages, except possibly for certain geographical adjustments.

A month ago we pointed out what such a plan would mean to contracting. Now we'll discuss what it means to labor—and we think it would be even more advantageous to labor than to the contractors.

Of course, workmen would be trained in, apply and be hired for their predominant skills. Yet they would not necessarily be limited to following any one special trade all the time. Through the years, as they had opportunity to apply their ability to more than one trade, they would develop into all-around, crack construction men instead of specialists where application of their specific trade is limited.

The proposed plan would enhance the continuity of employment, and tend to stabilize the labor force—and stabilization is what construction desperately needs. It would shake down the over-all labor force to a more realistic total, and would iron out the disrupting shortages and surpluses of any one craft as we now experience. Labor would be hired for the duration of the job, to apply its skills as needed without limitation.

It would encourage ambitious young men to enter construction as a career, for their progress would be based on all-around ability, instead of chance association with a restricted trade. They would learn construction, instead of a trade, and profit thereby. Apprenticeship as we now know it would be replaced by an on-the-job training program carried out with the full cooperation of the union.

A workman would develop and be up-graded according to his ability, and not be subject to the whim of any local trade leader. Most men are easily capable of learning and performing more than one trade. These capable fellows would become construction men, not prima donnas.

A consolidated union would give labor a solid front—a situation no doubt feared by many contractors. Yet, we believe this would bring about better union leadership—leadership that would recognize and accept the grave responsibilities involved.

Union administration would be under one top management, instead of being split up into 19 different departments and hundreds of autonomous locals as at present, with their jealous wrestling for power. Locals would give way to regional and area organizations, directly responsible to higher authority, which should result in better and more intelligent leadership at lower levels.

With every member of each classification receiving the same wages, the current practice of one craft jockeying and fighting to get more than the other fellow would be eliminated. No more dissatisfaction and malcontent by those who fail to win as much as the next guy.

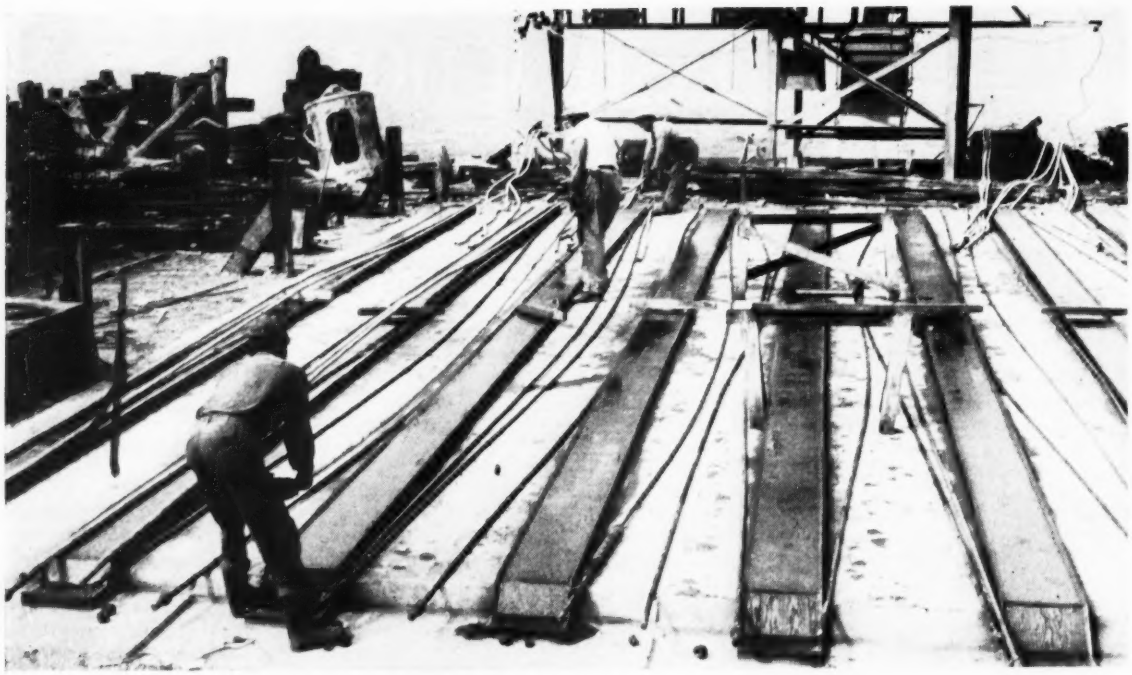
Another big advantage to labor would be in the pension and welfare fields—and these are here to stay. Instead of a thousand plans, each bitterly fought by the employers, there could be one sound equitable plan worked out to embrace every construction worker. No longer would a workman forfeit his pension and welfare rights when he moved from the jurisdiction of one local to another, as at present.

A consolidated union system would eliminate jurisdictional disputes that now cause labor so much senseless lost time. It would open the way to unlimited adoption of new materials, new processes, new construction techniques and procedures. Any new processes and materials would be handled by the most capable individuals, not necessarily by the trade that won them through a bitter fight that cost labor and employer dearly.

All this would encourage and stimulate construction through lower costs and higher efficiency. The construction-buying public is ever becoming more cost conscious. Labor will benefit, along with every other element of construction, by a continuous building program sparked by sensible labor relations.

Construction is bigger than any of its parts. The relentless law of economics will eventually force changes in any weakness in the construction system. Today, craft unionship is a weakness, doomed to extinction if it follows present practice. Some crafts will die of attrition; others are rapidly pricing themselves out of existence.

We believe consolidation of all organized labor groups into one big construction union is the logical answer. Then labor would assume even a greater responsibility by achieving full partnership—with the contracting, material, equipment and engineering elements of the industry—which it so richly deserves.



Pre-cut, pre-threaded alloy steel bars are basis of...

Simple Prestressing Methods On Tampa Bay Bridge

By HAROLD W. RICHARDSON, Editor

USING AN ENGLISH SYSTEM for the first time in this country, involving high-strength alloy bars instead of wires or cables, Hardaway Contracting Co., Columbus, Ga., and the Preload Construction Corp., New York, are prestressing 3 1/3 mi of concrete trestle on the Tampa Bay Bridge in Florida and making it look like a cinch.

At the casting yard at Port Tampa, they are prestressing 2,178 precast concrete girders with three 1-in. Stressteel bars per girder, and out on the trestle each set of six girders per span is being buttoned up laterally with two similar bars at the third points.

The Tampa Bay Bridge is one whale of a project, extending for 15.1 mi across the lower end of the bay. It is made up of hydraulic fill sections (in water 11 ft deep or shallower), concrete trestles, steel girder and truss spans, and one 100-ft double-leaf bascule over the Intercoastal Waterway. Steel structures include a cantilever truss span of 864 ft over the main ship channel with a minimum vertical clearance of 141 ft.

Hardaway's prestressing system is the result of a lot of cooperation among all concerned, including the Florida State Road Dept. and the consulting engineers on the project, Parsons, Brinckerhoff, Hall and Macdonald, of New York.

First call for bids was for 4,896 ft of concrete trestle, 136 spans of 36 ft each. Alternate bids were asked on cast-in-place deck and precast deck sections. Hendry Construction Co. was low with a proposal of precasting the deck in two units per span.

Next, the same alternates were asked on 17,424 ft of similar concrete trestle, but with a third option added: Six prestressed concrete girders on 48-ft spans, with a poured-in-place deck. Hardaway, in cooperation with Preload Co., Inc., came in with a bid on the prestressed design $184,000 lower than the next bid, Hardaway's, for cast-in-place trestle. Modification of the proposed design raised the cost $40,000, but still resulted in a saving of $144,000 to the state, or $8.26 per lin ft. Net cost is $192.60 per lin ft, or $5.66 per sq ft.

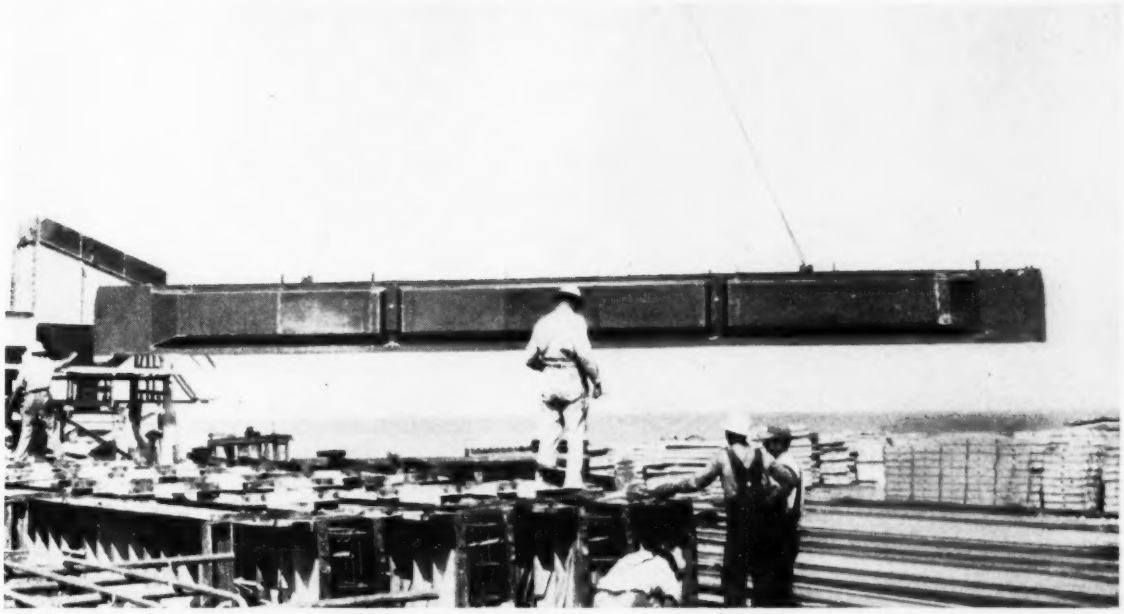
Girder Prestressing Simple

The concrete girders are precast on concrete platforms at a central yard at Port Tampa. Girders are I-shaped, 46 ft 10 in. long and 3 ft 4 in. deep with a 4-in. web, except at ends and third points, where the cross-section is rectangular, 14 in. wide. There are three high-strength 1-in. alloy steel prestressing bars in each girder, two horizontal in bottom flange, one curving downward from each end through the web.

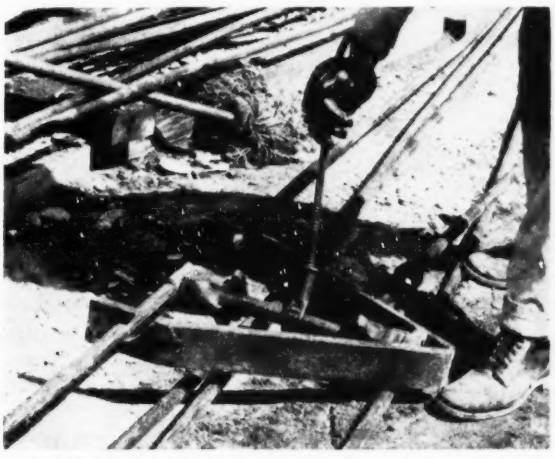
These bars, licensed under the Lee-McCall system of England, came from that country for this job. Now they also are being produced in this country by Stressteel Corp., in Wilkes-Barre, Pa., under a North American license. They are delivered to the job cut to length and threaded with a special taper thread at each end.

The original plan was to set the

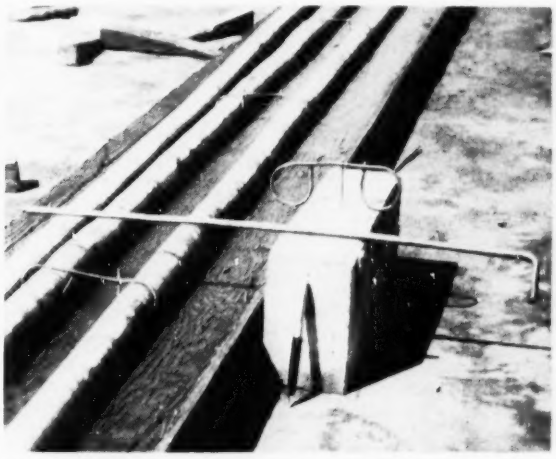
Setting Forms and Pouring Girders



GIRDER FORMS are simple, consisting of permanent plywood bottoms anchored to concrete casting beds with steel side panels, one of which is shown here being swung into space. Girders are I-beam in shape, except for rectangular ends and third points.



A MODIFICATION of the Jim Crow rail bender was used to straighten out prestressing bars messed up in transit. The bars must be in near-perfect shape in forms for desired results.



SPECTACLE WIRES laterally space two bottom bars. L-shaped rods shown here, are pushed through holes in form to position the bars vertically. Note the pencil shown for scale.

bars in the forms encased in paper wrapping, eliminating all bond between bars and concrete. Results of tests on the bar-and-nut assembly indicated the desirability of bonding the bars. A novel scheme worked out for bonding calls for encasing the bars with $1\frac{1}{2}$-in. spiral metal hose before installing them in the forms. After the bars are stressed, the space between bar and hose is filled with grout under pressure to effect the bond. Preparing, placing, stressing and grouting of the bars take an average of 10 man-hr per girder.

Details of placing prestressing bars, pouring the girders at the precasting yard, prestressing them, moving them to the bridge site and pouring the deck are shown in the accompanying pictures.

A Motorola two-way radio telephone system provides direct contact between casting yard, bridge site and floating plant.

P. A. Hakman is resident engineer in charge of the project for the consulting engineers, Parsons, Brinckerhoff, Hall and Macdonald, of New York. For the contractor, Hardaway Contracting Co. of Columbus, Ga., D. M. Plyler is project manager; Ralph Bird is superintendent of the Port Tampa yard; A. W. Goodale is superintendent at the bridge site; and J. E. Gibson is superintendent of trestle operations. A. D. Vick, Jr., is in charge of prestressing operations for Preload Construction Corp., New York.

(More photos on next page)

STEEL HAIRPINS inserted in the forms prior to pouring concrete hold bars and tubing in place laterally. These are removed before the concrete gets a chance to set firmly.

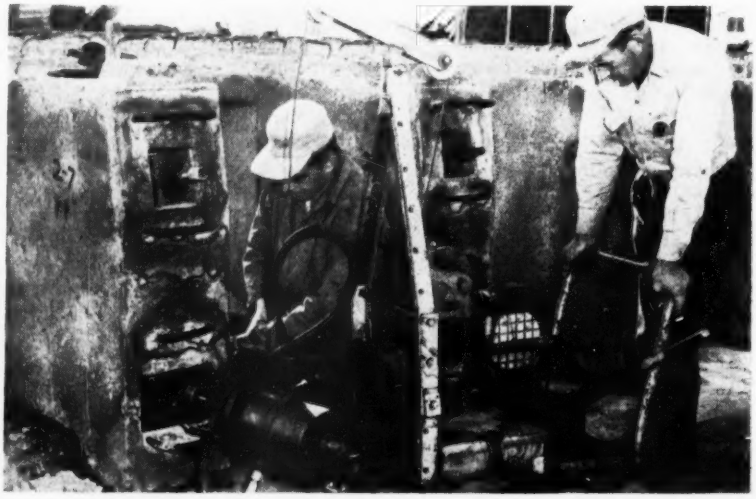
GIRDER FORM at left is ready for pouring except for placing end bulkhead. Bars and ducts are pushed through holes in end plate of form. Note plywood bottom forms at right.

AT THE CASTING YARD, concrete for the precast girders is mixed in an electrified Koehring paver, then delivered to the forms by bucket handled by a Clyde electric gantry crane.

GIRDER CONCRETE is vibrated internally from on top and externally by electric vibrators clamped to sides of forms, such as shown here. Four to six vibrators are used per form.

Last Operations in Casting Yard

1. Prestressing



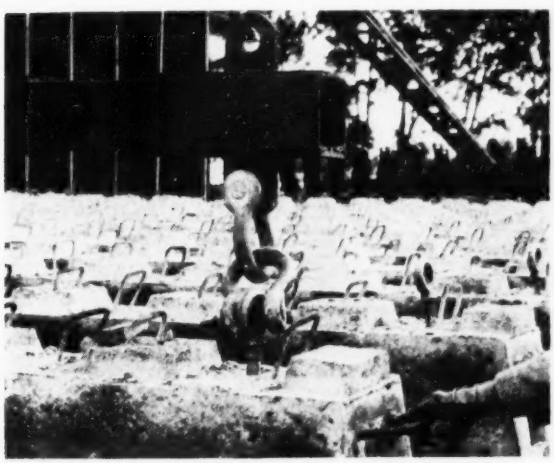
HERE'S THE CLIMAX to the prestressing procedure. The two lower bars are first prestressed with this portable jacking outfit. Then the top bar is prestressed with 37-ton pull that puts 94,000-psi tension into bars. If bar threads are too short, split washers are used as shims.

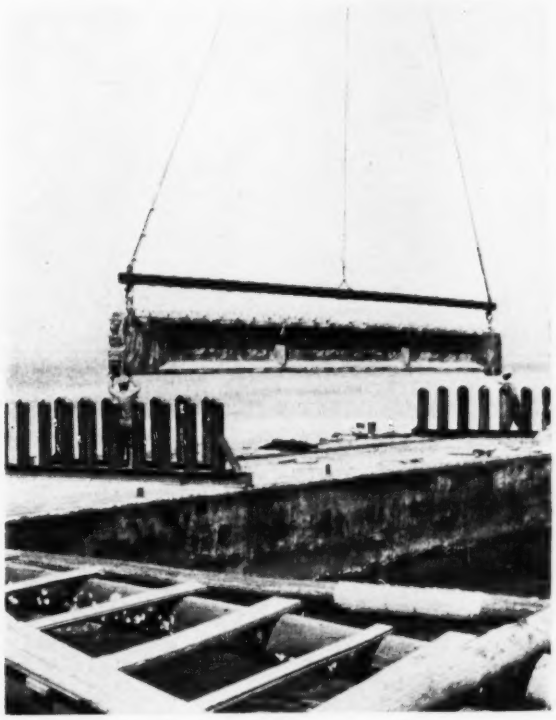
2. Grouting for Bond

GROUT PIPES ARE inserted at both ends of forms, but grout is applied from one end only. Proof of complete filling of tubing is evidenced by grout squirting from opposite end of form, as shown here. Completely filled tubing assures bond between bars and girder.

Moving Girders from Casting Yard to Bridge

BIG CLYDE 115-E gantry crane easily picks up and swings a pre-stressed girder from casting bed to storage yard.



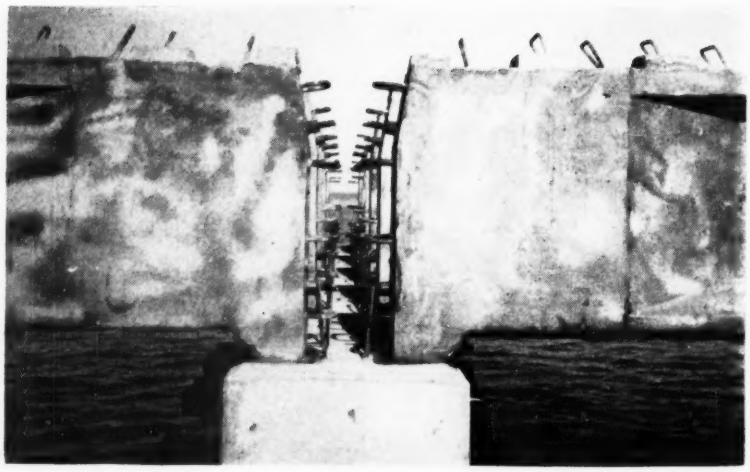


SAME CLYDE GANTRY is used to transfer the precast girders from storage to barges for transporting to bridge site.

HERE ARE DETAILS of eye-bolts and shackles, attached to strong-back beam, that are used for lifting finished girders from form to stock piles and to barges for transportation to bridge sites. Bolts have spiral threads.

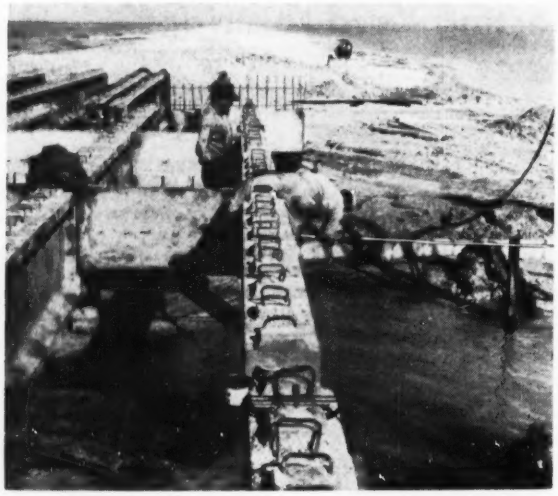
(More photos on next page)

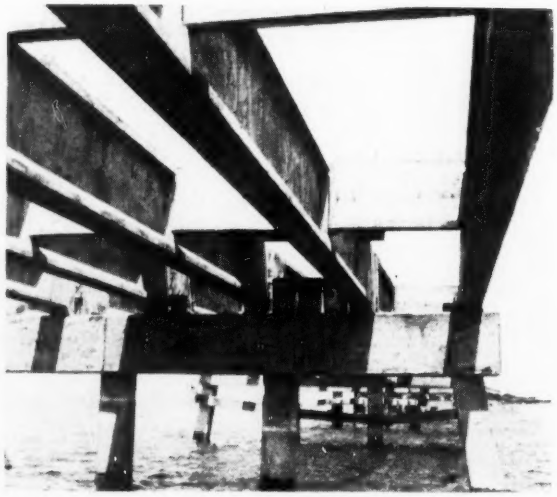
PRESTRESSED BRIDGE . . .
Continued



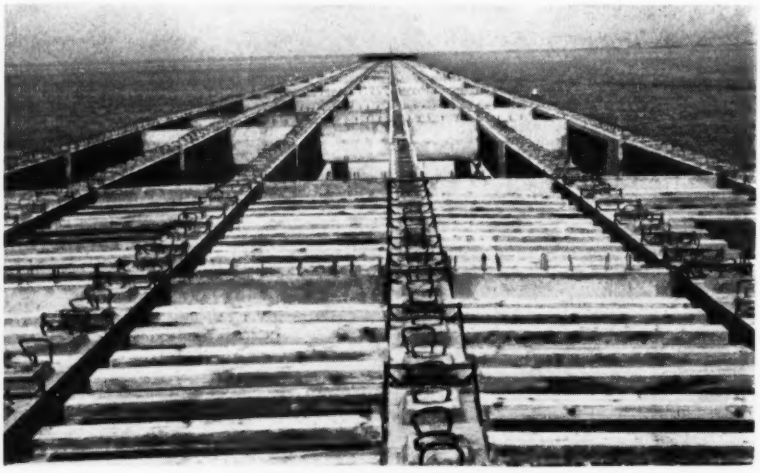
AT THE BRIDGE SITE girders are placed in final position on pile bent caps by a floating crane. Girders, six to a span, in position at the bridge, are ready for end diaphragms and deck slabs poured in place.

Lateral Prestressing and Pouring Deck in Place



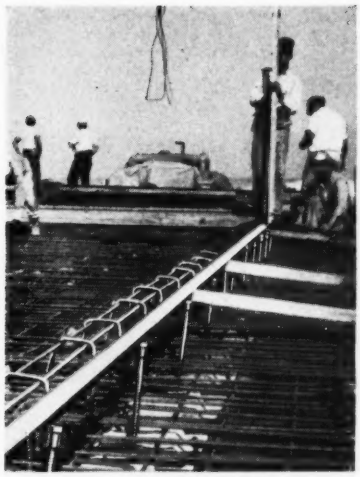


TOP AND UNDERSIDE VIEWS of structure show how girders are set in spans between bents. Precast diaphragms are placed, then lateral rods are threaded through girders and beams for transverse prestressing as shown in left photo.



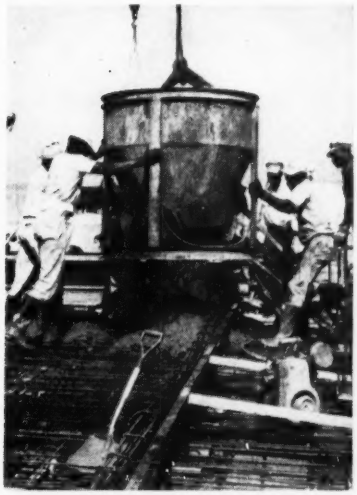
LATERAL PRESTRESSING SETUP is simple. Simplex hydraulic rig on top of deck supplies needed power to jack attached to end of transverse rod. This prestressing ties structure together.

EXTENDING almost as far as the eye can see, the deck forms take shape here as the stringers are hung from girder top flanges, later to be covered with plywood bottom panels.

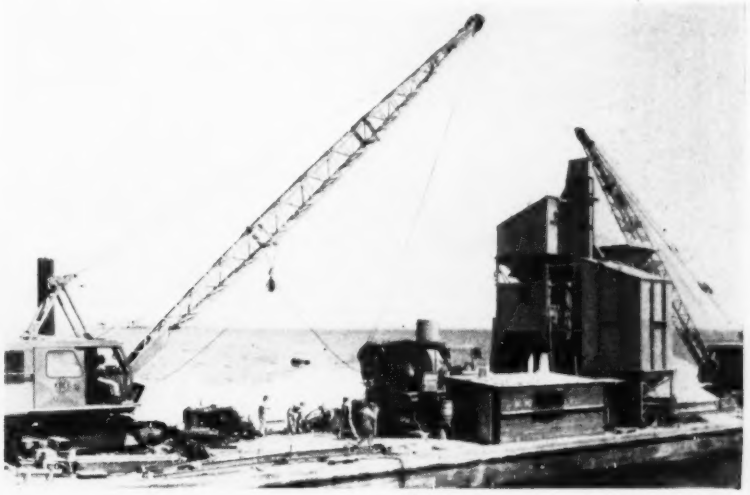


DECK SLAB templet guide rail, supported by adjustable Richmond Screw Anchor is accurately set to precise grade by rod and level.

LOOKING UP from down below, the details of cantilivered sidewalk forms can be seen.



DECK CONCRETE is mixed by floating plant anchored close to span. Concrete is placed by bucket handled by crane on mixer barge, as shown on left. Entire project is a good-sized one, extending 15.1 mi across the lower end of bay.

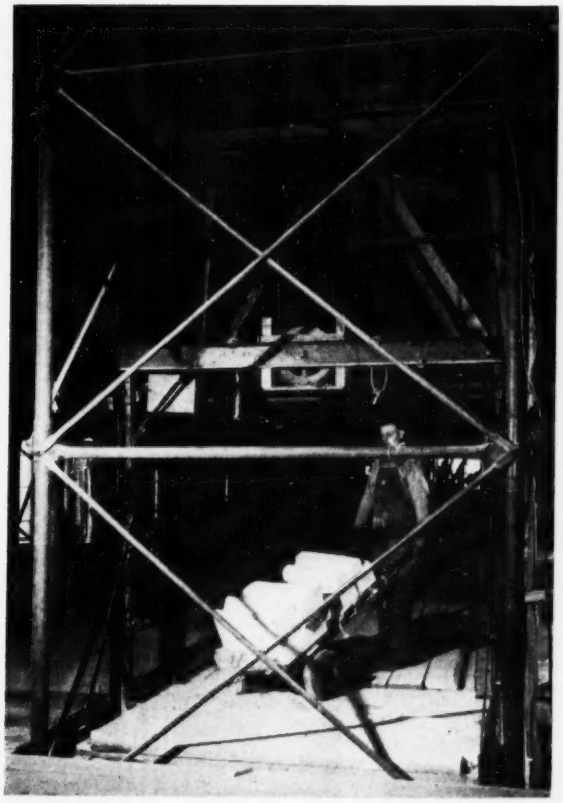


OUT ON THE BRIDGE, J. E. Gibson, superintendent of trestle operations for Hardaway Construction Corp., which includes pile driving, setting of precast girders and pouring deck slabs.

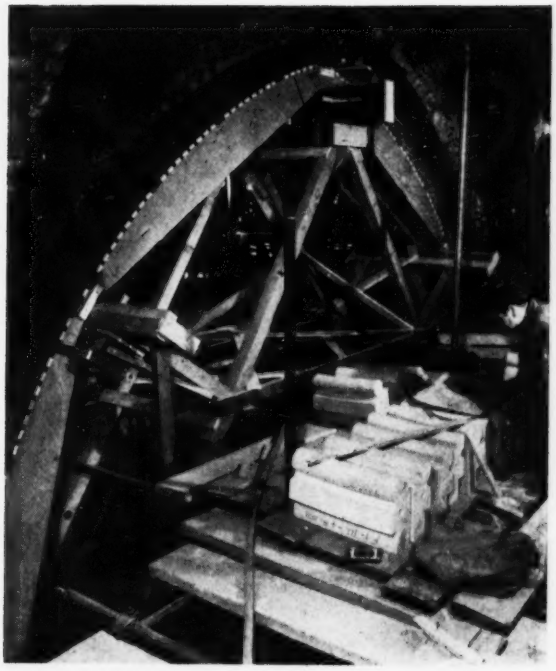
PROJECT MANAGER D. M. Plyler of Hardaway Contracting Co. (right) in front of finished girders at precasting yard, with A. D. Vick, Jr., superintendent for Preload Construction Corp.

FOR STONE FACINGS IN THIS CATHEDRAL it takes heavy scaffolding over a large area, eventually reaching 86 ft high. Hoist tower in center goes to 100 ft. Cathedral was erected 50 yr ago, but rough walls are being covered only now.

High Scaffolding Supports Heavy Stone



LOAD OF ARCH STONE being wheeled aboard hoist platform to be taken up to working level. Concentrated loads are handled safely on well-engineered scaffolding and tower.



ARCH FORM IN PLACE and facing stone on hand, final check is made on blueprint. Stone sections are designed for specific locations and have been numbered for identification.

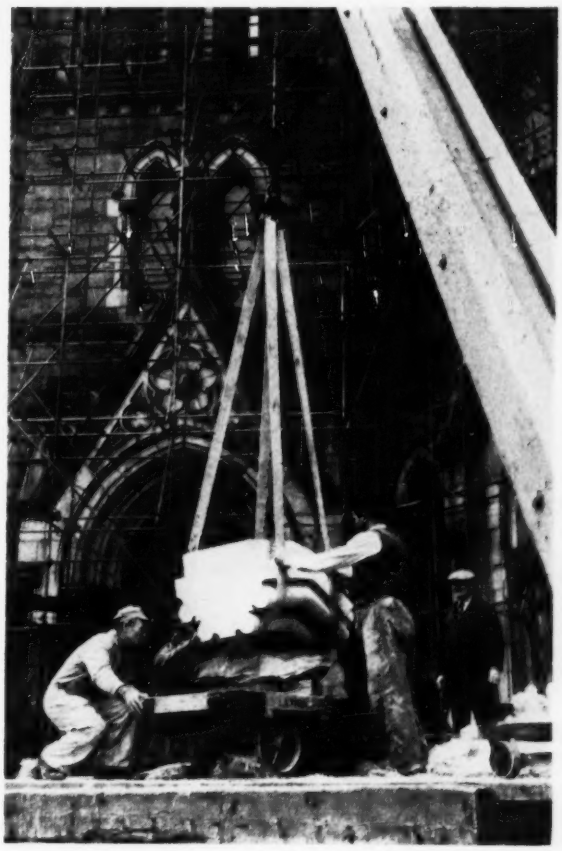
STONE-FACED ARCHES are a common sight in the interiors of churches and halls where extra efforts have been made to get special architectural effects. Putting the heavy facing stone into place requires a special skill and, when the arches are scores of feet up a high nave wall, an expert scaffolding technique also is required. Not only is the stone heavy, it also must be handled carefully to avoid damage in placing.

Such a job, with an air of the medieval about it, is under way at the Cathedral of the Sacred Heart in Newark, N. J. Stone arches are being set in the transepts, nave and crossing of the cathedral which has inside dimensions of 277x140 ft. Patent Scaffolding's TubeLox, 86 ft high and laid out to support loads up to 1,000 lb per lin ft, is installed.

Dimensions of arches vary from the smaller aisle arches, measuring 34 ft high by 12 ft inside, to the towering nave arches, 95 ft high and 46 ft inside. Indiana limestone used in the construction weighs up to 162 pcf. Materials and equipment are brought to working level by a Patent Scaffolding Gold Medal steel hoist tower 100 ft high.

The Cathedral of the Sacred Heart has an unusual history. It was constructed of stone 50 yr ago. But its rough walls were never completed and the original "shell" has stood vacant ever since. Now, the interior pillars, walls and arches are being finished, and stained glass is in fabrication for the clear windows.

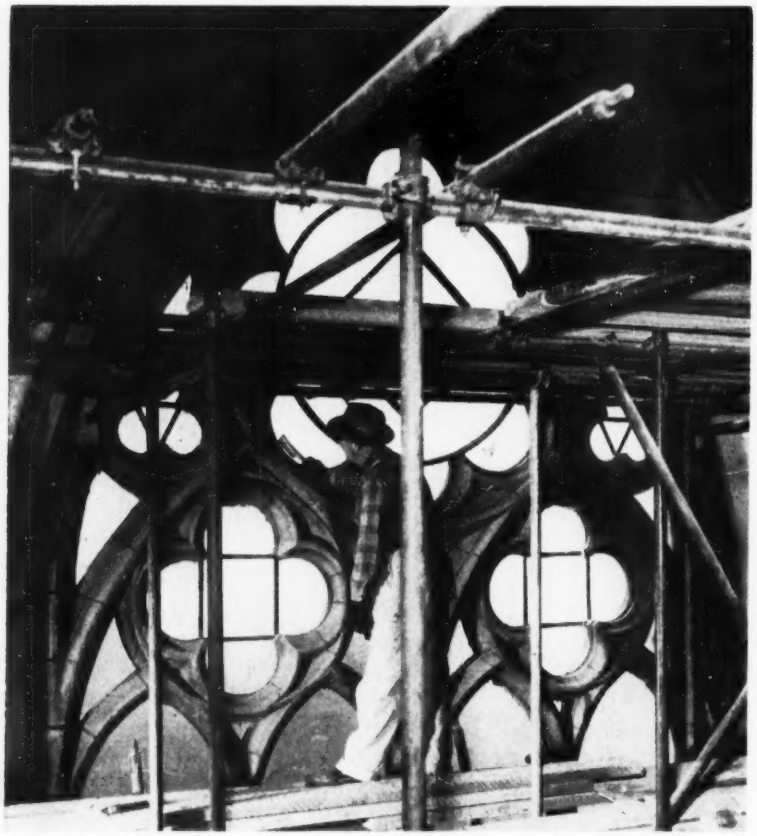
In addition, the outer walls had weathered to the extent that it became necessary to repoint the entire exterior of the cathedral, including two 200-ft spires. Number of sectional scaffolding frames used inside and



CRANE EASES KEYSTONE, weighing 1½ tons, on padded hand-truck for trip to nave arch 95 ft high. Scaffolding around outside of building was used to repoint stone in 50-yr-old outer wall.

KEYSTONE IS SPOTTED exactly in the center at top of a nave arch, almost 100 ft above floor level. The form is blocked carefully to keep stone sections in exact line and position. Small sections will be fitted snugly on each side of keystone to finish arch.

FINAL LIFT of keystone to last level of scaffold is by small hoist taking 1½-ton block of Indiana limestone up between framing members of tubular scaffolding.

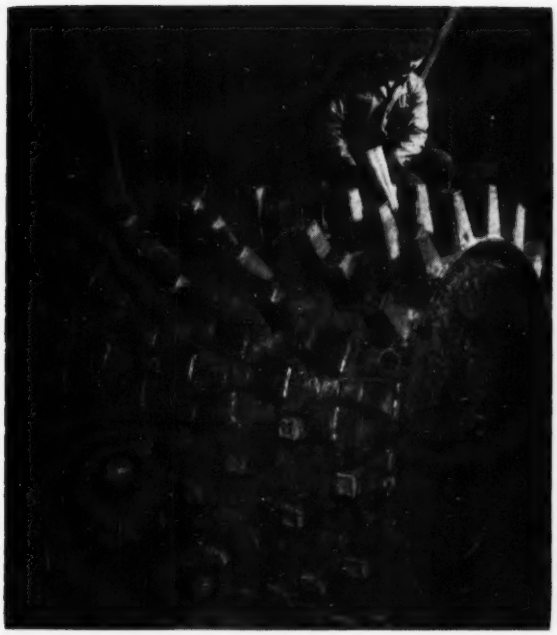


CLEANUP BEGINS after all stonework has been completed and before scaffold sections are taken down. Windows in clerestory have been clear glass, but now will be knocked out and replaced with stained glass. High rolling scaffolding can be used for this work.

out was 1,200. Before stone setting began, stained glass artisans employed Trouble Saver rolling scaffolds as high as 90 ft to measure windows.

Facing stones of Indiana limestone all are designed to fit specific positions in designated arches —are cut, numbered and brought to the job as the setting progresses. They are handled carefully all the way. Stones for an arch are set from the bottom up on each side over a wood form and keyed to keep them in line.

General contractor is the George A. Fuller Co., New York. James F. Murphy, vice-president, is supervising the job and James Taylor is construction superintendent. Stone setting is by Robert L. MacLean, Inc., Tuckahoe, N. Y.; Herbert Deitz, foreman. Scaffolding and hoist tower erection is by the Chesebro-Whitman Co., Long Island City.



HOME-MADE SHEEPSFOOT ROLLER has drum fabricated from ¾-in. material, all-welded construction

FOR LONGER LIFE each tooth is hardsurfaced by four manual rod passes. Total of 5,072 ft of welding was done on this unit

Contractor Makes His Own Sheepsfoot Roller

"WHY BUY $8,000 WORTH of equipment when you can make it yourself for $3,500?" says Mr. Replogle of the C. F. Replogle Co., a road contracting firm in Circleville, Ohio. The company fabricates much of its own equipment and has just finished the latest addition, a sheepsfoot roller, at a saving of $4,500.

The roller consists of two 60-in. dia drums fabricated from ¾-in. material. All welding, a total of 5,072 ft, except tacking and hardsurfacing the teeth, was done with the hidden-arc process making use of manual Lincolnweld equipment.

The rollers can be filled with calcium chloride solution for ballast and have 3-in. plugs for drainage.

Each roller has 288 teeth which were flame-cut from ½-in. angles, 9 in. high, 5 in. square at base and 3 in. square at top. The teeth then were fabricated by welding angles together with half open corner joint. The 3-in. square plate was welded to the end, and then the teeth were attached by welding the 5-in. square bottom to the drum using the hidden-arc process. Each tooth was surfaced on the 3-in. square end with four manual rod passes of a semi-austenitic type hard surfacing electrode, thus making a total of 8 ft of welding on each tooth.

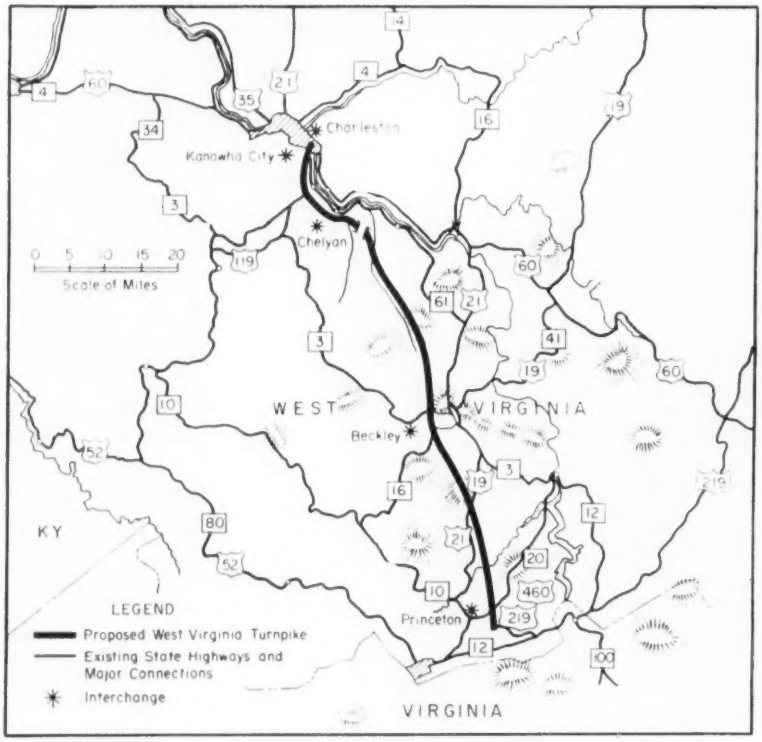
A 2-in. thick plate, 8 in. square, was used inside for the bearing housing; ¾x16x18-in. plate was used as stiffener and inspection plate cover; frame and tongue were fabricated from 12-in. channels, 11 ft 8½ in. long, and a 1x30x36-in. plate was welded on the tongue assembly. Four boxes, attached to the frame to be used for additional ballast and balance, were made from ¼-in. plate 29 in. wide, 30 in. high and 6 ft 3 in. long.

TEETH ARE WELDED to drum. Roller has 288 teeth, each one 9 in. high, 5 in. square at base and 3 in. square at top.

Motorists' West Virginia Turnpike view is spectacular but . . .

Contractors' View is "Hard Work, Rough Going"

By RALPH H. LEWIS, Associate Editor



$96,000,000 WEST VIRGINIA TURNPIKE stretches 88 mi from Charleston to Princeton, W. Va. The two-lane road will have creeper lanes for trucks.

PROBABLY THE MOST INTERESTING ROAD IN THE COUNTRY is the under-construction West Virginia Turnpike. It will take better than 30 contractors, $96,000,000 worth of private funds, a year and a half of real rugged construction work to complete the 88-mi, two-lane road that snakes through the mountains south of Charleston on down to Princeton, West Va.

The project started in January of this year and is scheduled for completion in June, 1954. Then motorists will travel over the 88 mi of paving consisting of two 12-ft lanes with 9-ft stabilized shoulders and truck "creeper" lanes on the 3 to 5% grades. They'll pass over some 80 bridges, three of them good-sized ones, too, and will whisk through a tunnel bored 2,640 ft through a mountain. They'll have big sweeping curves engineered for high-speed travel, and they'll enjoy scenery that is breathtaking.

They'll be saving themselves one-half as much driving time as compared to the 110-mi route with grades as much as 9% that must be traveled now.

Too few of these tourists will

realize that the toll they'll probably pay back to the private investors of the $96,000,000 and for maintenance of the road will help to compensate for the sweat, toil, and equipment know-how it took to build this road.

Many of the travelers won't realize that the steep sides of the cuts were made through solid rock and go up in some places as much as 150 ft. They'll be breezing along too fast to see the many fills that were built up as much as 120 ft in spots, some of them ½ mi long.

Not many of the joy-riders will care, but at one time it required forty-nine 2½-cu yd shovels, something of a record, to move the dirt and rock to make that road. For high-finance-minded people, it will be interesting to know that more than $10,000,000 worth of equipment was working on the road at one time in July.

The term "unclassified excavation with lots of rock" won't mean much to a trucker or motorist, but the road he will be on required more than 25,000,000 cu yd of "unclassified excavation." Some of it as high as 500,000 cu yd per mile. At one time more than a million cu yd of this material was being moved per week.

Even the Dead Disturbed

The traveler won't be aware of it, but more than 700 homes had to be moved or destroyed, 1,000 acres of right-of-way cleared, a couple of producing oil wells had to be moved, and even the dead were disturbed when graveyards were relocated to make way for the West Virginia Turnpike.

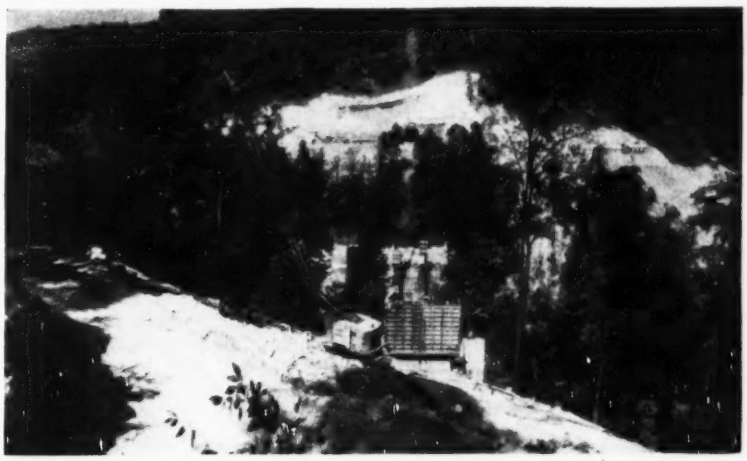
On some stretches of the road, what appears to be "benches" cut into the side of the mountains through which the road passes really are benches. They were cut and blasted there because it was necessary to keep the mountains from sliding down on to the road.

For a total of 20 mi the auto riders will see other new appearing secondary roads alongside the turnpike. They are new roads, relocated by the Turnpike Commission at a cost of nearly $3,000,000.

Near Cabin Creek, the motorists will have to slow down to 35 mph to go over a beautiful quarter-mile long bridge that stretches more than 264 ft above the bottom of a deep canyon. At the north end of the bridge they'll enter a tunnel 27 ft wide that cuts through a mountain for 2,640 ft.

They should really be thankful that tunnel is there, for if it weren't

BEGINNING OF THE 2,640-FT TUNNEL that will save the motorist 27 mi driving. Note that the jumbo used by contractor Bates & Rogers is mounted on Athey tracks instead of the conventional rails.



VIEW LOOKING NORTH shows one of the abutments that will carry a bridge over a deep valley. The tunnel and original survey line are in the background.

STUB LIMA SHOVEL and LeTourneau-Westinghouse Tournapulls are being used in the tunnel operations. It will require 90,000 cu yd of excavation to complete bore.

THE OTHER APPROACH to the tunnel. This cut is being made to hold to a 3½% grade. At one time there were almost fifty 2½-cu yd shovels on the project. During one week more than a million cu yd of dirt and rock were moved by the equipment.

they would have to travel 27 mi to get on the other side of that mountain. It took 90,000 cu yd of excavation to make this tunnel. The easy 3½% grade in the tunnel, the driver will never notice. What he will notice, though, is that this tunnel is one of the best lighted in the world. They are going to put glass beads on the roof, plus light-reflecting tile, so when the driver comes into the tunnel from the bright sunlight, he won't suffer temporary blindness, as so often is the case in other tunnels at present.

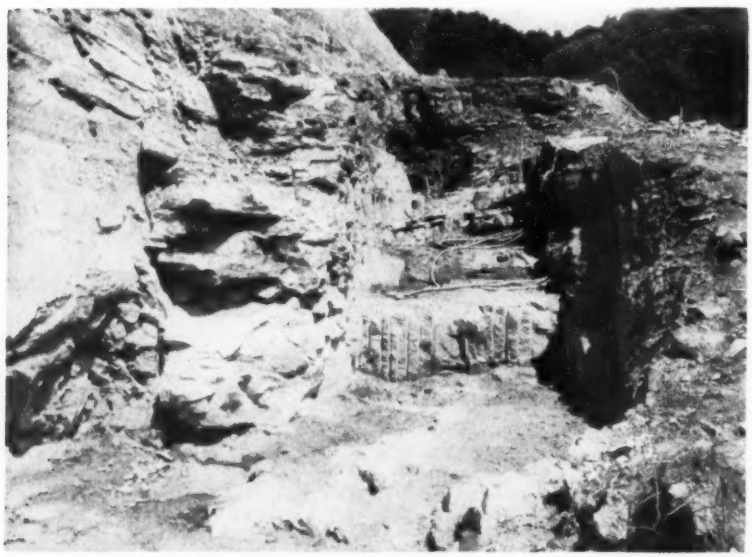
From time to time the occupants of the automobile will see modern little buildings located near the road. These little buildings were the homes of the engineers who guided the construction and will later house maintenance personnel and equipment.

One thing for sure, it won't take the motorist long to travel the 88 mi, and the contrast with the roads approaching the West Virginia Turnpike will be something of a shock to him.

This controversial project is not without its share of troubles. Not so much from the actual construction side, which is plenty rough, but mostly from individuals and groups from within the state, who apparently have lost sight of the fact that with the completion of this expressway, it will not only be the best in the state, but also will represent the greatest single improvement recently accomplished in highway transportation.

The West Virginia Turnpike Commission has been criticized for its failure to make the road four lines initially instead of the two lanes now being constructed, and has been pressured by another group attempting to persuade the Commission to pave the road with concrete rather than asphalt.

The reason for the two-lane expressway instead of four was summed up nicely by an official who said, "If a contractor has only the need for a 5-ton truck he buys a 5-ton truck—not a 10-ton one." It was clear in the initial studies



THIS WILL GIVE YOU a good idea of what contractors are up against during the construction or the road. This cut is being made for a bridge abutment.

POURED CONCRETE BRIDGE PIERS, five in all, plus two abutments, will carry the steel and roadway for a quarter-mile-long structure over a 264-ft canyon—the deepest on the entire road. At the north end of this bridge is the tunnel.

that the cost of a dual highway in severe mountainous terrain would jeopardize feasibility, being out of proportion to the traffic and revenue initially available for this expressway.

In spite of the opposition encountered from individuals or groups, as to whether the road is paved with concrete or asphalt, or whether it's two or four lanes, when they cut the ribbon on the 88-mi stretch sometime next year, it unquestionably will be one of the finest toll roads in the country, and it will be a lasting monument to the integrity, skill and ingenuity of the West Virginia Turnpike Commission, its engineers, contractors, workers and equipment.

As the motorist is rolling down the smooth paving admiring the scenery, he'll probably think nice things about the new-fangled toll roads such as the West Virginia Turnpike. He won't bother to check history and learn that the first toll road ever built was 4,000 yr ago from Babylon to Syria. Even in our own country we had a toll road more than 168 yr ago in Virginia.

For an idea that is more than 4,000 yr old, the motorists should wonder why here in the United States we have only 840 mi of modern toll roads, but he'll be lots happier when he learns that more than 1,750 mi of such roads are presently under construction.

He can thank many persons and firms for the fine road he traveled on when in West Virginia.

Bear, Stearns & Co., New York City, were principal underwriters of the bond issues, and Howard, Needles, Tammen & Bergendoff have over-all charge of design coordination and construction supervision. Gannett, Fleming, Corddry and Carpenter; Fay, Spofford & Thorndike, and Capitol Engineering furnished construction plans and supervision for the three sections of the turnpike. Of course, the more than 30 contractors and crews deserve their thanks, too.

(Continued on next page)

FIELD OFFICES similar to this one were used by engineers on the West Virginia Turnpike. They will later be moved and will house maintenance and equipment.

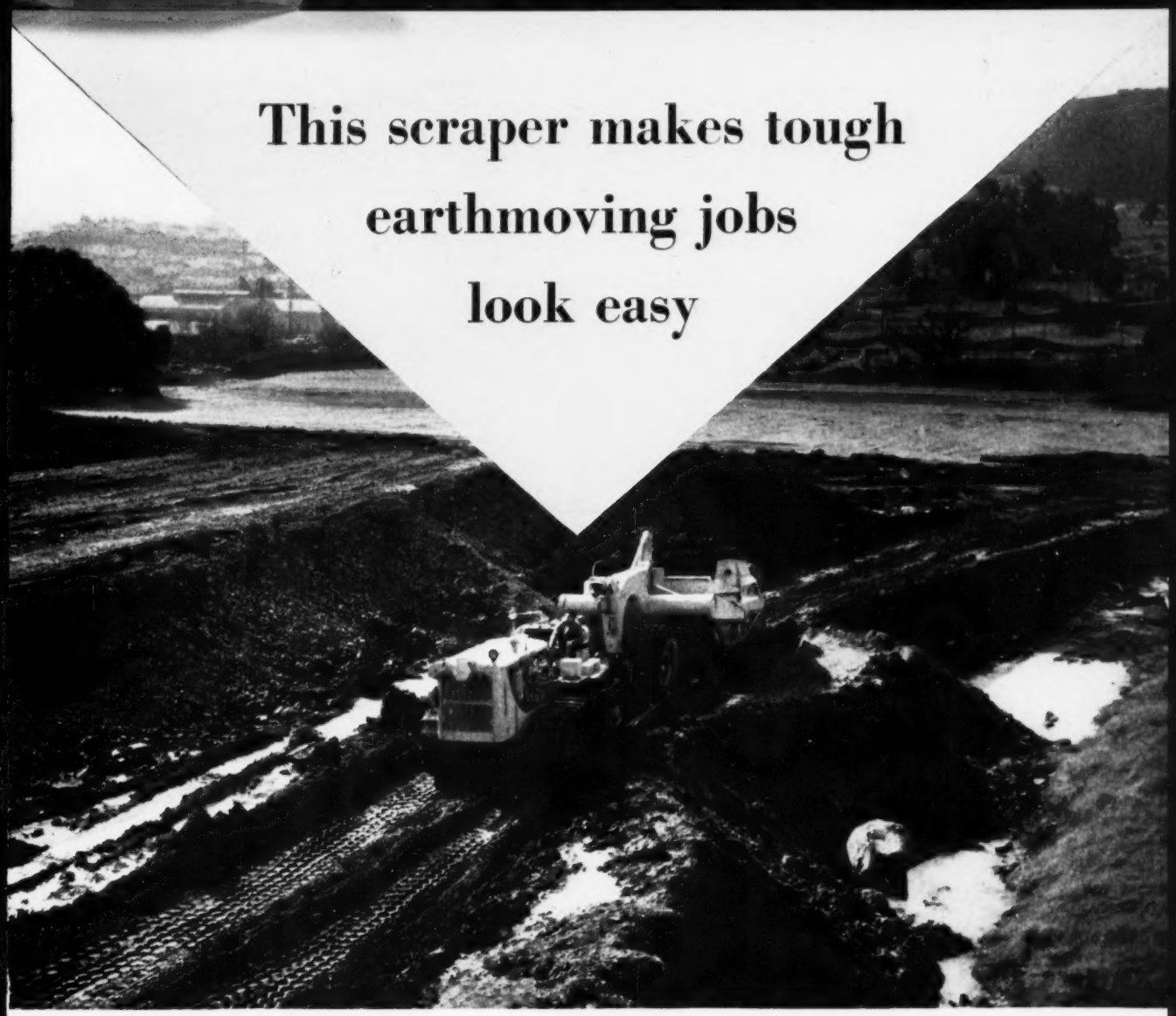
BENCHES such as shown here are being used in many sections to keep loose rock from sliding. More than 25,000,000 cu yd of unclassified excavation will be required to complete the project started early this year by June of 1954.

Line-Up of Jobs and Contractors on West Virginia Turnpike

CONTRACT	DESCRIPTION	NAME AND LOCATION OF CONTRACTOR
1A	Borings for Bluestone River Bridge	Mott Core Drilling Co. Huntington, W. Va.
1B	Borings for Fourmile Fork Bridge	Mott Core Drilling Co. Huntington, W. Va.
1C	Borings for Tunnel	Giles Drilling Corp. New York, N. Y.
1D	Borings for Kanawha River Bridge	Mott Core Drilling Co. Huntington, W. Va.
2	Borings for Section 1	Cunningham Core Drilling & Grouting Corp., Salem, Va.
3A	Borings for Section 2	Pennsylvania Drilling Co. Pittsburgh, Pa.
3B	Borings for Section 2	Mott Core Drilling Co. Huntington, W. Va.
4A	Borings for Section 3	Cunningham Core Drilling & Grouting Corp., Salem, Va.
4B	Borings for Section 3	Mott Core Drilling Co. Huntington, W. Va.
5	Structural Steel Fabrication	Bethlehem Steel Co. New York, N. Y.
6	Structural Steel Fabrication	American Bridge Division New York, N. Y.
7	Structural Steel Erection	American Bridge Division New York, N. Y.
8	Grading, Drainage, Substructures, Mile 9.0 to 10.5	C. E. Wetherall Co. Huntington, W. Va.
9	Grading, Drainage, Substructures, Mile 20 to 25	Oman Construction Co., Inc. Nashville, Tenn.
10	Grading and Drainage Mile 68.3 to 71.3	Nello L. Teer Co. Durham, N. C.
11	Substructure— Bluestone River Bridge	Lewis & Bowman, Inc. Goldsboro, N. C.
12	Substructure— Fourmile Fork Bridge	Bates & Rogers Const. Corp. Chicago, Ill.
13	Substructure— Kanawha River Bridge	Maxon Construction Co., Inc. Dayton, Ohio
14	Tunnel Bore & Lining	Bates & Rogers Const. Corp. Chicago, Ill.
15A	Tunnel Ventilating Fans, Motors, Transmissions	American Blower Corp. Detroit, Mich.
16	Tunnel Ventilating Bldgs. & Install Fans, Motors, Etc.	Kuhn Construction Corp. Charleston, W. Va.
17	Tunnel Electrical Equipment	Jandous Electric Constr. Co. New York, N. Y.
18	Grading, Drainage, Substructures, Mile 0 to 4.8	Nello L. Teer Co. Durham, N. C.
19	Grading, Drainage, Substructures, Mile 4.8 to 9	W. E. Graham & Sons Cleveland, N. C.
20	Grading, Drainage, Substructures, Mile 11 to 14	Ralph E. Mills Co. Frankfort, Ky.
21	Grading, Drainage, Substructures, Mile 14 to 20	Condon-Cunningham Co. & Peter Kiewit Sons Co. Omaha, Neb.
23A	Grading, Drainage, Substructures, Mile 25 to 32	Central Pa. Quarry, Stripping & Const. Co., Hazleton, Pa.
23B	Grading, Drainage, Substructures, Mile 32 to 36	Latrobe Road Coast., Inc. Latrobe, Pa.
24A	Grading, Drainage, Substructures, Mile 36 to 41	Latrobe Road Const., Inc. Latrobe, Pa.
24B	Grading, Drainage, Substructures, Mile 41 to 46	Clark-Farrell Co. & H. N. Rodgers & Sons Co. Memphis, Tenn.
24C	Grading, Drainage, Substructures, Mile 46 to 50	H. W. Holt & Son Columbus, Ohio

(Continued on page 70)

This scraper makes tough earthmoving jobs look easy



WORKING on a contract that called for moving 395,000 cubic yards of rock and clay and grading a 70-acre industrial site in 5 months' time, J. O. Archibald of Redwood City, California, needed rugged equipment with plenty of power and capacity. The terrain was half hill and half swamp. Fourteen Caterpillar Diesel Tractors, with Bulldozers and Scrapers, were used in completing the contract, for Mr. Archibald believes in standardizing on big yellow equipment. But he found one of the most efficient units for this type of job was the Cat* D8 Tractor-No. 80 Scraper combination.

The flat-bottom No. 80 is a brute for work. It handles 20 cubic yards heaped on every swing. Positive cable controls permit easy, accurate control of digging and spreading. Big tires give ample flotation in soft ground, and make hauling smooth. The push-plate, extending well back of the tires, allows in-line power for the pusher.

The surest way to *prove* what the No. 80 Scraper can do for you is to see it in action on your own job. Your Caterpillar Dealer will gladly arrange a demonstration. Call him today.

Caterpillar Tractor Co., Peoria, Illinois.

CATERPILLAR*

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NAME THE DATE... YOUR DEALER WILL DEMONSTRATE

TURNPIKE . . . Continued from page 68

CONTRACT	DESCRIPTION	NAME AND LOCATION OF CONTRACTOR
25A	Grading, Drainage, Substructures, Mile 51.6 to 54.9	S. J. Groves & Sons Co. Minneapolis, Minn.
25B	Grading, Drainage, Substructures, Mile 54.9 to 57.9	S. J. Groves & Sons Co. Minneapolis, Minn.
26A	Grading, Drainage, Substructures, Mile 57.9 to 64.0	Groves, Lundin & Cox Minneapolis, Minn.
26B	Grading, Drainage, Substructures, Mile 64.0 to 67.6	Groves, Lundin & Cox Minneapolis, Minn.
27	Grading, Drainage, Substructures, Mile 71.3 to 80.3	Ralph E. Mills Co. Frankfort, Ky. Morrison-Knudsen Co. Boise, Ida.
28A	Grading, Drainage, Substructures, Mile 80.3 to 81.7	L. S. Coleman Co. St. Albans, W. Va.
28B	Grading, Drainage, Substructures, Mile 81.7 to 83.4	Boso & Ritchie, Inc. Ravenswood, W. Va.
28C	Grading, Drainage, Substructures, Mile 87.4 to 88.0	Standard Asphalt & Tar Co. Charleston, W. Va.
28D	Grading, Drainage, Substructures, Mile 83.4 to 85.9	Boso & Ritchie, Inc. Ravenswood, W. Va.
28E	Grading, Drainage, Substructures, Mile 85.9 to 87	Suber & Co., Inc. & R. G. Foster Co. Whitmire, S. C.
34	Bridge Decks for Struc. 13 thru 45, incl.	Lewis and Bowman, Inc. Goldsboro, N. C.

Keep Drivers Right or They Might Be Left Injured

BECAUSE A DRIVER of a dirt-loaded Euclid failed to keep on the right side of a haul road, he crashed head-on into an empty Euclid truck traveling on the correct side of the road, injuring both himself and the other driver. His error cost the contractor at least $6,500.

The violator was moving down a 6% grade and took the wrong side on a gradual curve. The crash knocked the tractor of the empty Euc off the road and down a 10-ft embankment. The front end of the trailer was also moved off the road. Medical care for the two drivers amounted to $850. Additional cost of clearing the road, moving damaged equipment and repairs, delay in production and hiring and training of one new driver proved to be an expensive lesson for the contractor on the results of careless driving.

All Galion All-steel dump bodies are now made of high tensile steel — up to 25% lighter and stronger than ordinary dump body steel.

FOR HYDRAULIC HOISTS AND DUMP BODIES, THE BUY WORD IS GALION

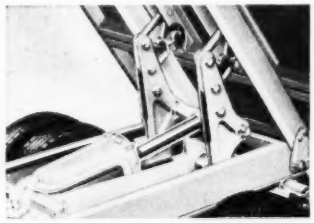
GALION MODEL 880 heavy duty hydraulic hoist and Model 12 contractors body easily handle 10½ to 15½ ton loads.

If you want built-in ruggedness, *extra* lifting and *extra* carrying capacity . . . always specify Galion! Galion hydraulic hoists and dump bodies work longer with less maintenance and lower operating costs. With Galion, jobs begin on time, continue steadily without interruption . . . end on schedule.

For big jobs (or for little ones), Galion manufactures a complete line of standard and heavy duty hoists and dump bodies to meet every construction need. And . . . if you need extra heavy duty or special units to fill unusual requirements, Galion will be glad to design and build them for you.

A 7042

GALION MODEL 700 hydraulic hoist with steel subframe, ideal for loads of 6½ to 8½ tons.



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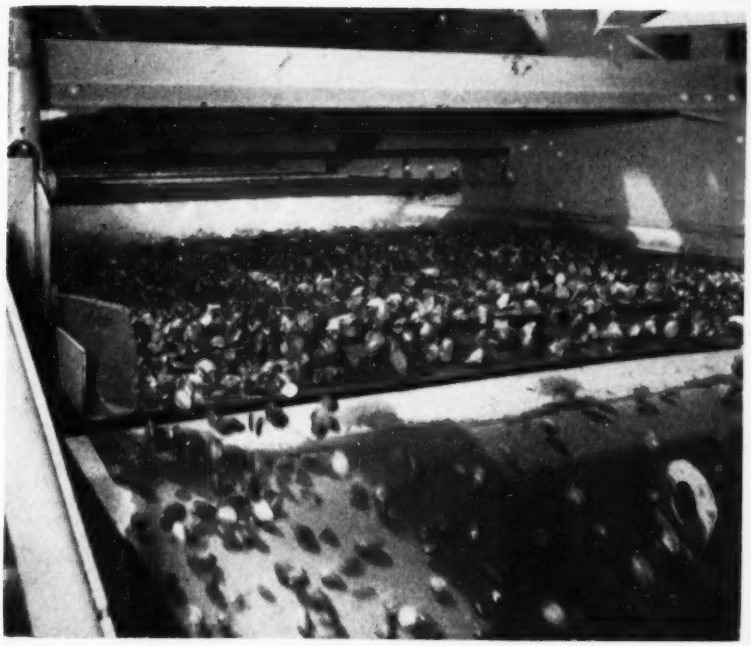
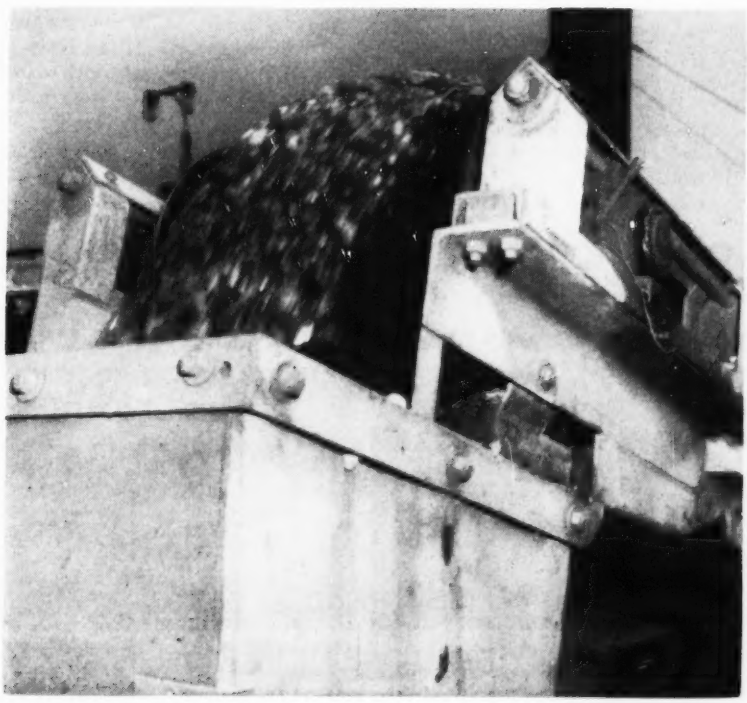


TOP QUALITY GRAVEL tumbles over an Allis-Chalmers vibrating screen after separation from lighter unacceptable material by flotation. Water spray helps recover heavy media.

Plant Improves Gravel...



RIVER GRAVEL pours off feed belt from dredge into receiving hopper at one end of separation drum. Plant currently produces about 150 tons per hr, operates 18 hr daily.

...Dredged From River Bed

QUALITY IMPROVEMENT POSSIBILITIES for gravels used as aggregate in concrete took a healthy stride forward this last year with the introduction of the heavy media separation process on a commercial scale. Probably the first to develop a pilot plant (beginning in 1949) for full commercial production was the Keystone Division of the Dravo Corp., Pittsburgh, Pa.

Keystone dredges gravel from the Ohio River and serves both company-owned and dealer sales outlets in a wide area. Recently another heavy media separation plant has been announced: The land-based operation of the Owatonna (Minn.) Aggregates Corp.

Operation of these plants is based upon the simple fact that material dumped into a liquid either will float or sink—depending upon the specific gravities of liquid and material dropped into it. By controlling specific gravity of a liquid, materials can be regulated pretty well between sink and float.

In the floating heavy media gravel plant operated by Keystone Division for Dravo, an artificially heavy liquid is created by keeping finely ground magnetite (powdered iron) in suspension in water. Desirable gravel sinks and is loaded out as top quality material for commercial uses. Substances of lower specific gravity, such as wood, coal and grainy sandstone, float and are shunted off to waste.

Gravel from the new plant has come through stiff quality tests with flying colors, and enough experience has been gained to permit dredging in contaminated areas previously rated as untouchable.

Dravo's Keystone heavy media plant is self-contained upon a hull 50 ft wide, 40 ft long and 7½ ft deep. Its width squares exactly with the river dredge supplying feed gravel, and the two are lashed together. All of the company's gravel is produced here with production averaging around 150 tons per hr; the design is for a maximum 225 tons per hr. The plant operates about 18 hr daily most of the time. Operation is by one man who has little more to do than run periodic checks on specific gravity of the media, make adjustments and lubricate the machinery.

Total power required is 90 to 100 kw, including conveyors. Cooper Bessemer diesels turn Elliott generators that supply the various electric motors and magnets throughout the plant.

(Continued on page 74)

THE CASE OF THE PHANTOM TRACTOR THAT PULLS IN REAL PROFIT!

Ask any progressive owner or operator why he equips his tractor with a Hyster Towing Winch. He'll say, "It's almost like having a second tractor up ahead all the time... ready to help you when you need it most." That's another way of saying Hyster Winches greatly increase tractor uses for more profit.

Hyster Winches increase tractor pull up to 92% over drawbar pull!

Full tractor engine power can be extended the length of the winch-line. Permits tractor to reach out and rescue stuck equipment, pull in logs or heavy objects. Saves time and keeps jobs going in all kinds of weather.

Matched Design of Caterpillar-built Tractors and Hyster Winches provides proper balance to develop maximum tractive effort—with good operating stability and maneuverability.

Only Caterpillar-Hyster has *truly-matched* tractors and winches. Yes, and *only* Hyster has 19 models and sizes of winches to fit all Caterpillar-built tractors and for all types of winch jobs.

THERE'S PROFIT IN HYSTER POWER

Ask your Caterpillar-Hyster Dealer for the *right* winch to increase the profit on your job, or write to:

HYSTER COMPANY
2921 N.E. Clackamas, Portland 8, Ore.
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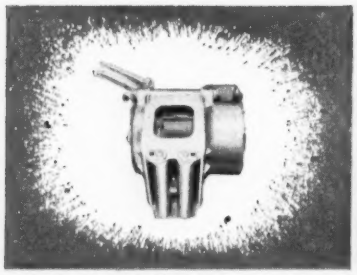
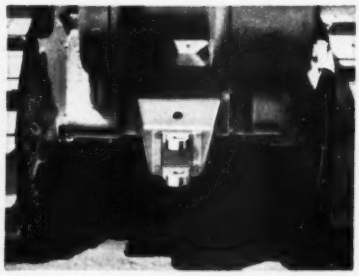
THERE ARE OVER 40,000 SATISFIED HYSTER WINCH OWNERS!

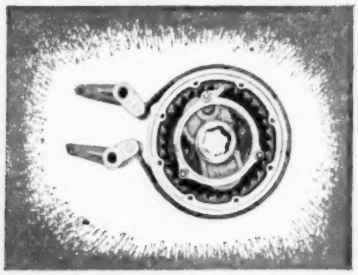
HYSTER TOWING WINCH ATTACHMENTS and FEATURES INCREASE WINCH EFFICIENCY and USEFULNESS



FAIRLEAD ASSEMBLY saves time maneuvering the tractor into yarding position. Reduces wear to winchline and tractor crawler assembly and saves fuel. Permits yarding from any angle to the rear of the tractor without the necessity of leading winchline straight from load to drum. (Optional for Models D8L, D7N, D6N)



BUILT-IN DRAWBAR provides added strength and rigidity to withstand severe vertical stresses encountered in arch logging and certain types of heavy-duty service. Yoke can be set in swiveling or non-swiveling (fixed) position. (Standard equipment on Model D8L, optional on D7N, D6N)



AUTOMATIC BRAKE, of special patented design, permits operator to pre-set brake before winching in a load—eliminates need for close coordination in controlling brake and clutch. For added safety, all brakes can hold loads greater than winchline capacity. (Optional on Models D8L, D7N, D6N)

HYSTER... the most complete line of tractor winches on the market!

So DIFFERENT... They're Patented!

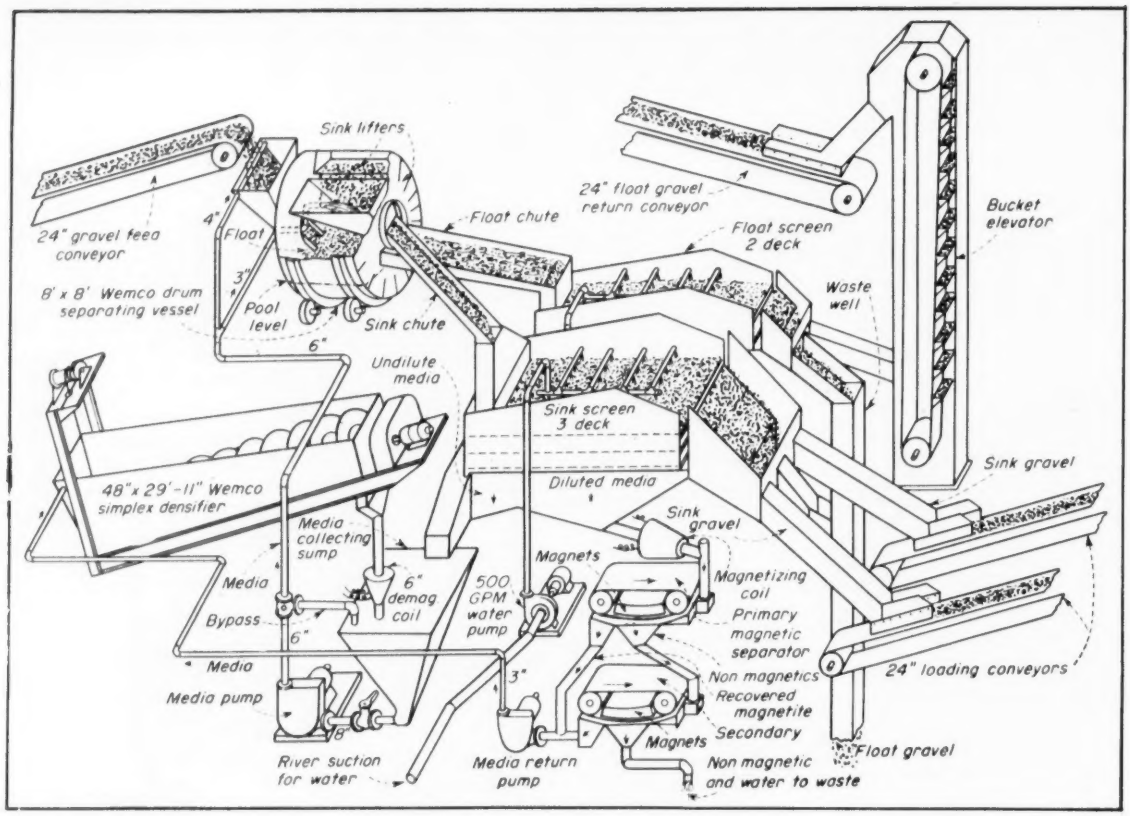
Power Plus Anti-Rust Protection at No Extra Cost

Here are fuels so *different* they have been PATENTED – so *revolutionary* in action that they result in actual dollar savings for Sinclair users.

How? Sinclair fuels – and *only* Sinclair – contain the rust inhibitor RD-119®. This amazing chemical forms an invisible waterproof film throughout the equipment's fuel system – from fuel tank to combustion chamber. Used regularly in gasoline engines, Sinclair Gasoline with RD-119 *prevents* rust and corrosion – can save you costly repairs to carburetors and fuel pumps. Regular use of Sinclair Diesel Fuel containing RD-119 eliminates the problem of rust-clogged injectors.

Now, get *Full Power, High Anti-Knock* PLUS the *Anti-Rust Protection* of RD-119 – exclusive with Sinclair... AT NO EXTRA COST! Phone your local Sinclair Representative today about Sinclair Anti-Rust Fuels.

Sinclair Refining Company, 600 Fifth Ave., New York 20, N. Y.



PLANT OPERATION is outlined clearly by schematic sketch. Actual plant is quite compact, is built on a 50x40-ft hull.

How Heavy Media Separation Works

River gravel feeds from the dredge into an 8x8-ft Western Machinery Co. drum which turns from 1 to 3 rpm. The heavy media also is fed into the system at this point. Powdered magnetite used is so fine that about 80% passes a 100 mesh screen. Media consists of about 70% magnetite and 30% water by weight. Magnetite has a specific gravity of 4.9. Keystone operates with a media specific gravity of 2.2 - 2.3. This can be adjusted readily.

The densifier holds about 21 tons of magnetite. It is the stabilizer or "flywheel" of the operation. Raising or lowering the feed screw in the 29x4-ft densifier determines the amount of magnetite in the media circuit and consequently the specific gravity. Magnetite in the densifier is fairly "dry," not fluid.

The densifier screw operates continuously and feeds magnetite to a sump where the media is collected. A 6-in. pump delivers media to the Wemco separating drum by piping. Magnetite is kept in suspension by keeping the fluid moving at all times. When pumping stops, the magnetite settles out.

The drum is about one-third full of media all the time, and weir height at its discharge opening is about 3 in. Here the light gravel, the "float," discharges from the drum to the float screen. The heavy gravel, "sink" gravel, falls to the bottom where it is collected by lifter plates attached to the drum. As the drum revolves, gravel drops from the lifters on to a chute for delivery to the sink screen.

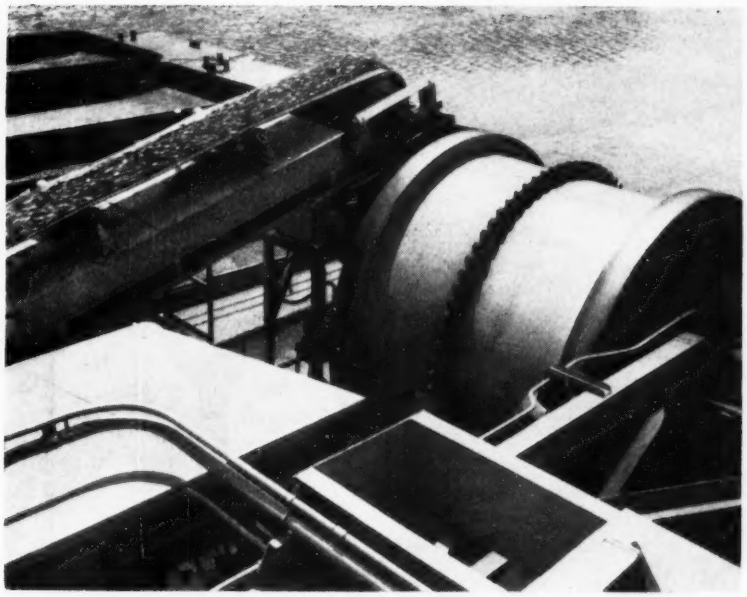
A float screen removes media from the gravel and then discharges the float material into one of two places. It can go to the waste well which empties into the river, or it can discharge into a bucket elevator which starts float material back to the crusher on the dredge. This latter setup has not yet been used, but it is intended to experiment in the future and see if this float material cannot be crushed to increase the percentage of fines in Keystone's sand.

Sink material goes from the drum to a 6x16-ft Allis-Chalmers Lo-Hed Screen where the media is washed from the gravel and then, by means of its three decks, gravel is graded to meet specifications.

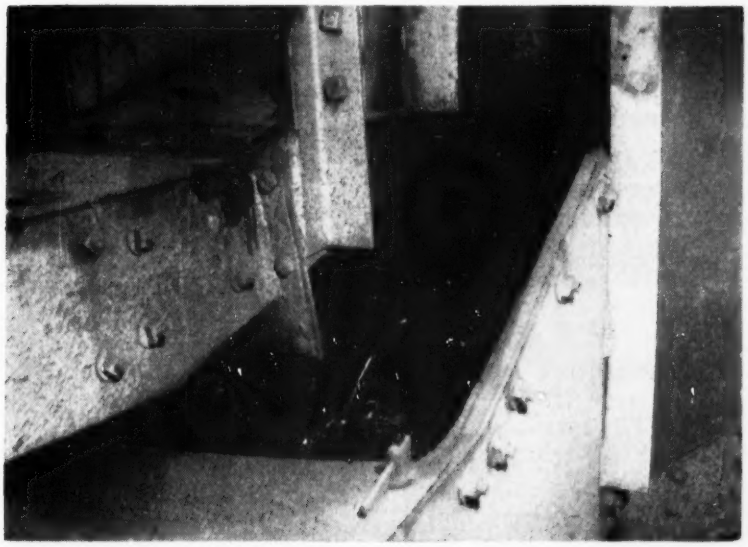
Reclamation of media is the same for both float and sink screens. Between the back end of the screen and an adjustable baffle, about 90% of the media falls from the gravel, goes down a chute into the media-collecting sump where it is blended with the rest of the media in the system. Since no water has been added up to this point, the specific gravity of this media is the same as it was in the drum.

Beyond the baffle there are spray pipes, and the remaining 10% of the media is washed from the gravel. During this process, since water is used to spray the gravel, the media becomes diluted. This diluted media next goes through a coil which magnetizes the powdered magnetite and causes it to cling together in large particles.

Magnetized media is passed through two belt-type



SEPARATION DRUM is a Western Machinery Co. 8x8-ft model rotating about 2 rpm. It receives dredge gravel from 24-in. belt at left. Drum is 1/3 full of heavy media liquid and has lifter plates on inner sides to pick up sink particles and send them off to screens.



DISCHARGE END of the drum. Black liquid flowing out is heavy media which floats off lightweight gravels and foreign matter. Specific gravity readings are taken here to insure quality of "sink" gravel which comes out of drum through covered chute above liquid.

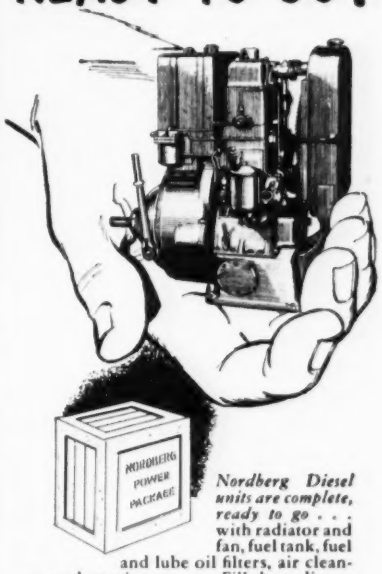
magnetic separators which operate in series. Each separator has a rubber conveyor belt which passes below a set of magnets in the diluted media. As the diluted media passes along this belt, magnetite is held against the belt and travels along to the discharge end. Nonmagnetic material and water go overboard as waste.

Magnetite carried by the belt to the discharge end of the separator is directed into a chute and thence to a 3-in. Wemco media recovery pump which transfers the media mixture back to the Western Machinery densifier. At this point, the media is not completely dry, and it is necessary to return it to the densifier to eliminate excess water. This excess water overflows from the densifier and, just to make sure it is not carrying media to waste, is returned to the magnetic separator for another go around.

A demagnetizing coil around the media discharge tube from the

(Continued on page 78)

Here's your
COMPLETE, COMPACT
NORDBERG
Diesel Engine . . .
READY TO GO!



Nordberg Diesel units are complete, ready to go . . . with radiator and fan, fuel tank, fuel and lube oil filters, air cleaner, and starting system. Fill the radiator, crankcase and fuel tank and you're producing reliable, low cost power . . . for power units on shovels, for crane magnets, for pumps in mines, quarries, and irrigation, for petroleum production pumping, for auxiliary generator sets ashore and afloat, for standby lighting units in manufacturing plants—and for hundreds of other power jobs.

Built in 1, 2, and 3-cylinder sizes from 10 to 45 hp, these heavy duty medium speed units are available as straight power units with stub shaft or clutch power takeoff—as generator sets producing from 6 to 30 K.W.—and as "packaged" centrifugal pumping units.

Send the coupon today for more details.

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NORDBERG
BUILDERS OF AMERICA'S LARGEST LINE OF HEAVY DUTY DIESELS

MAIL THIS COUPON TODAY

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Send catalog covering Nordberg Type 4FS Diesels. I am interested in a unit for the following service: CM

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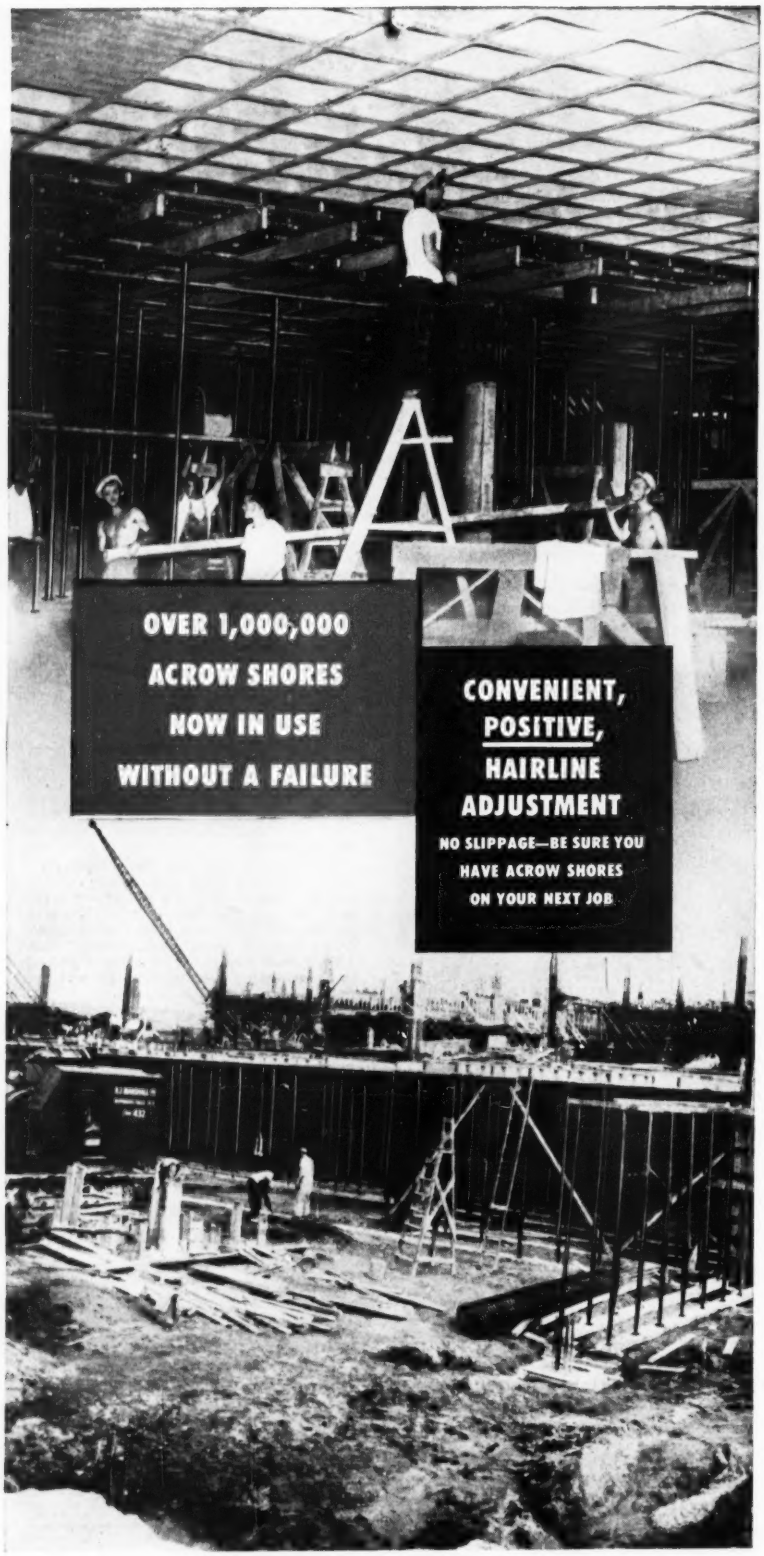

8,000

Photo shows Size 4 Acrow Shores being used 4' on center, extended to 14'6" under slab and steel pans.

ACROW SHORES used on "Pan" job

ACROWS SAVE TIME AND MATERIALS IN GRID FLAT SLAB SYSTEM OF CONSTRUCTION

Sordoni Construction Company of Wilkes-Barre, Pa., used over 8,000 Acrow Shores for erecting additions to the IBM Plant at Poughkeepsie, New York. No horizontal bracing was required because of the high loading capacity of Acrows. Acrows are quickly adaptable and highly recommended for any reinforced concrete slab system. For safe, sure support, specify Acrow adjustable Steel Shores.

ACROW ADJUSTABLE STEEL SHORES

Acrows are safer, stronger, easier to handle. They are always ready for instant use. One man can erect an Acrow Shore in less than a minute, and strip it just as quickly. All-steel construction eliminates costly maintenance. Working loads are fully established and guaranteed. SELF-CLEANING patented stud on collar automatically clears the thread of concrete and dirt when adjustment handle is turned, assuring quick, easy stripping, and keeping the Acrow Shore ready for your next job.

GENERAL SPECIFICATIONS
Shore Sizes, Dimensions, Weights, and Capacities

	HEIGHT			FAILING LOAD		RECOMMENDED SAFE WORKING LOAD	
Size No.	Fully Closed	Fully Extended	Weight in Lbs.	Fully Closed	Fully Extended	Fully Closed	Fully Extended
1	5 ft. 7 in.	9 ft. 10 in.	46	10.96 tons	8.97 tons	8210 lbs.	6720 lbs.
2	6 ft. 7 in.	10 ft. 10 in.	49	10.50 tons	7.90 tons	7840 lbs.	5975 lbs.
3	8 ft. 2½ in.	12 ft. 5½ in.	56	10.15 tons	7.55 tons	7490 lbs.	5600 lbs.
4	11 ft. 0 in.	15 ft. 0 in.	69	7.27 tons	2.89 tons	5800 lbs.	2050 lbs.

ACROW . . . World's Largest Selling Shore

ACROW, INC., 510 North Dearborn, Chicago 10, Illinois
Dept. CM-9

UNITED STATES OFFICES

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New York, LExington 2-7595
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Philadelphia, LOcust 7-5553
Atlanta, Emerson 3716
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Acrow (Engrs.) Ltd., London
Acrow Engrs. (Pty.) Ltd., Johannesburg
Acrow Engrs. (Pty.) Ltd., Sydney

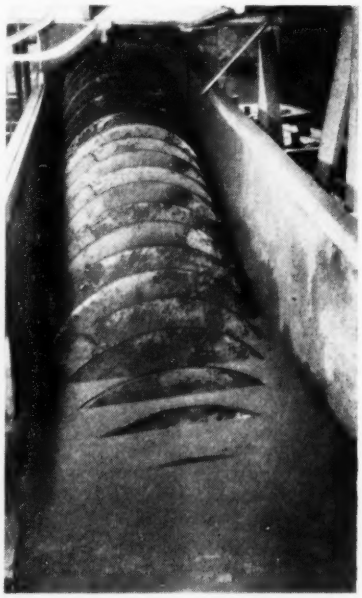
GETTING A RIVER OUT OF BED

When a river blocked progress on this construction job, the contractors used large diameter Naylor pipe to get the river out of the way. When the job was completed, it was a simple matter to put the river back to bed. Applications like this are typical of the services that this distinctive, extra-strong, lightweight pipe is performing for contractors the world over. Naylor pipe is easy to handle and install—especially with the Naylor Wedge-Lock coupling to speed connections. Sizes from 4 to 30 inches in diameter. Write for Bulletins No. 507 and No. 513.

NAYLOR PIPE COMPANY
1268 East 92nd Street, Chicago 19, Illinois
New York Office: 350 Madison Avenue, New York 17, New York

BETTER GRAVEL

. . . Continued from page 75



WEMCO DENSIFIER dewaters magnetite to desired percentage and dumps material back into sump to complete media circuit.

densifier demagnetizes the magnetite and disperses it, allowing it to remain a finely ground powder with no magnetic attraction between the particles.

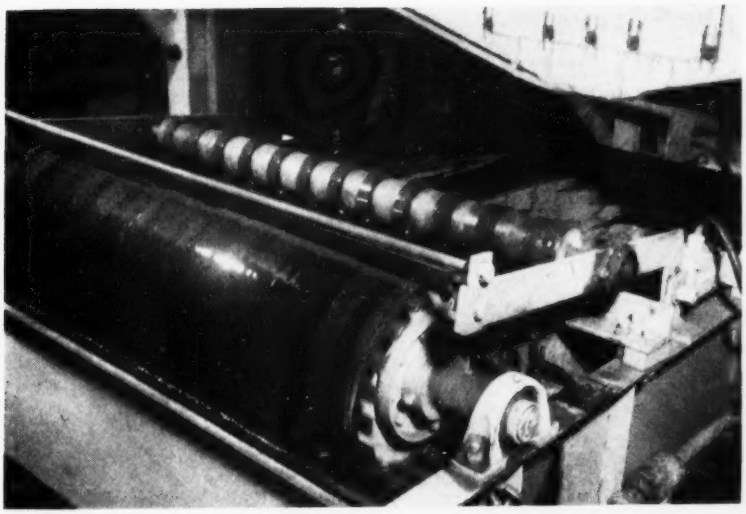
Material for the plant is dredged up by Dravo's regular floating dredge and fed into the feed hopper of the Wemco separation drum by a conveyor belt 100 ft long and 24 in. wide. Finished gravel emerges in two sizes and is loaded aboard two barges moored alongside by media plant belt conveyors.

Magnetite lost overboard during the process currently is about 0.75 lb per ton of gravel feed. Ground magnetite costs about $40 per ton delivered.

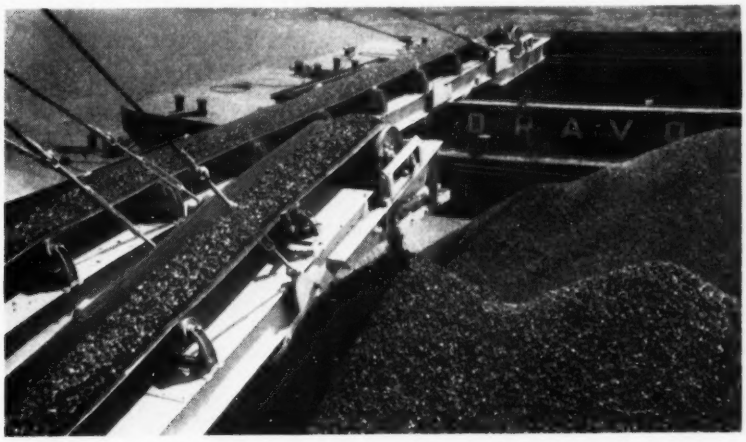
Gravel Improves

Dravo's plant started production in May 1952 and was operated through last year's season. It has been going steadily again this year and, although still very much a pilot plant, it has lived up fully to expectations. With all foreign material removed, gravel has improved greatly in appearance, too.

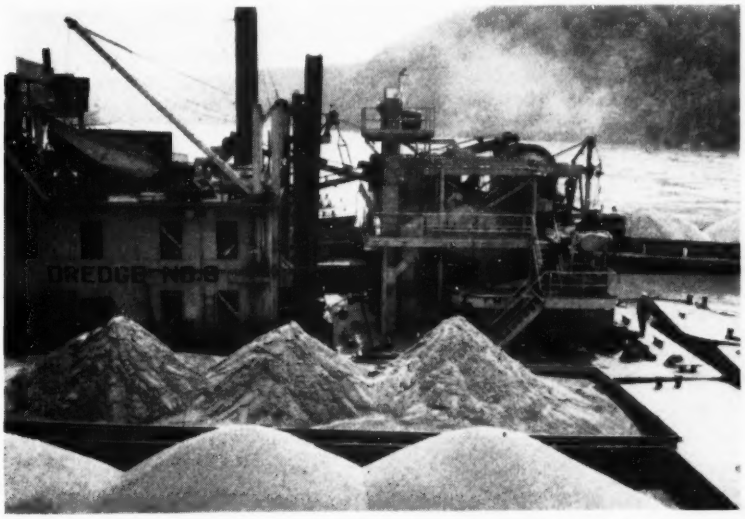
But there still are some problems to be licked. One of the more important is that of obtaining a closer classification of material inside the drum. Separation of larger particles of gravel is pretty well defined, but in the smaller sizes particles do not sink as readily and a fair amount of good material



MAGNETIC SEPARATOR, a 48-in. Wemco belt-type, recovers powder-fine particles of magnetite from water sprayed over gravel to wash it clear of media before wasting overboard.



END PRODUCT is good-looking gravel streaming off two delivery conveyor belts in two commercial sizes. Barges are drawn alongside, moved by powered capstan as they fill.



HEAVY MEDIA PLANT is compact, built on special hull measuring 50x40 ft. It is lashed tightly against Dravo's Dredge No. 9 which brings up Ohio River gravel in a steady stream.

(Continued on next page)

FOR AN "ON-THE-GROUND" INSURANCE POLICY

FOR an "on-the-ground" insurance policy equip your tractors with Carco winches. Carco winches reduce "down time" by converting your tractors into mobile general utility tools . . . by doubling tractor pulling power and increasing tractor "reach." They are instantly available for towing heavy machinery, rescuing mired or ditched equipment, pulling pipe, stumps, rocks, buildings and riggings, setting poles, clearing and cleaning up as well as a multitude of other uses that help keep your jobs moving ahead on schedule. See your nearest Carco dealer for more complete information. PACIFIC CAR AND FOUNDRY COMPANY, Renton, Washington. Branches at Portland, Oregon, and Franklin Park, Illinois.

WINCHES
For All Industrial Tractors

CARCO

Why the 1022 is the best ratchet lowering jack for general purpose use
2. strongest oblong rack bar
1. versatile foot lift
3. patented spring mechanism

This rugged 10-ton Jack is one of the most popular in the Duff-Norton line for average lifting, lowering, and pushing jobs because (1) It can use its foot as well as its head; (2) It has the strongest rack bar of any jack of its weight and capacity; (3) It is equipped with the exclusive, patented spring mechanism which assures absolute safety and longer trouble-free service life.

If you are not using the famous 1022 in your shop, get the complete specifications on this and the many other Duff-Norton Jacks. Call your local distributor or write the world's oldest and largest manufacturer of lifting jacks. Ask for catalog 203T, The Duff-Norton Manufacturing Company, P.O. Box 1889, Pittsburgh 30, Pa. Canadian plant—Toronto 6, Ontario.

DUFF-NORTON

"Giving Industry A Lift Since 1883" **Jacks**

passes out with the float product.

Repairs have been minor. Piping for media suffers some from abrasion, mostly at elbows, turns and other places causing turbulence. Rubberized hose is being tried around bends. The only other major maintenance item has been an occasional replacement of screen plates.

Dravo engineers caution anyone interested in building a heavy media separation plant to make complete tests on the gravel deposit to be worked. Specific gravities undoubtedly will vary, and it is possible that certain types of undesirable material will not be removed by flotation.

But the boys at Keystone Division are enthusiastic about their plant and feel they have made a real contribution to production of high-grade gravel—realizing all the while that further experimentation should improve the operation in many ways. In areas where it would be an advantage economically to be able to work inferior gravel deposits the heavy media process can well be the answer. It can be as useful to a contractor on a large construction project as to a commercial supplier of gravel and ready-mix.

Development of the floating plant has gone forward under the able guidance of L. P. Struble, Jr., general manager, and W. L. Price, engineering manager, of Keystone Division, Dravo Corp.

Lift and Carry Safely

DO NOT attempt to lift awkward or heavy materials alone. Get some help.

Look carefully for tripping hazards.

Check carefully for sharp corners or nails that might cause an injury.

Set your feet solidly, somewhat apart. Crouch as close to load as possible. Keep your back straight, but bend at the hips so you are over the load. The object is to do the heavy work with your leg muscles and not with the weaker back muscles.

To lift, straighten your legs and swing your back into a vertical position.

In setting the object down, bend your legs and the trunk of your body at the waist.

When two or more men are carrying the load let one man give instructions.

FOLSOM DAM

A 25-ton Lorain Moto-Crane handles materials during construction of steel trestle which will serve concreting operations.

$65,000,000 CHALLENGE TO CALIFORNIA'S AMERICAN RIVER

A 2-yard Lorain 820-J uses a 60-ft. boom and dragline bucket to dredge gravel taken from a nearby stream bed.

Power and irrigation project to bring Sacramento Valley new water control!

Much has been written about the fabulous Folsom Dam . . . key structure in the American River Basin development. To California's Sacramento Valley it will mean a new future of flood control, irrigation and power.

Job facts are symbolic of the genius and foresight of our country's engineers. The overall project is rated at $65,000,000 — under the jurisdiction of U. S. Army Engineers and The U. S. Bureau of Reclamation. The dam's main concrete section is 1400 ft. long, 340 ft. high. 9,000,000 yards of earth and rock excavation is involved — plus 8,800,000 yards of fill on wing dikes extending 2 miles on the sides of the dam. 8 rolled-earth saddle dikes also are to be built around the reservoir rim. Every conceivable material from sand to bed rock must be moved.

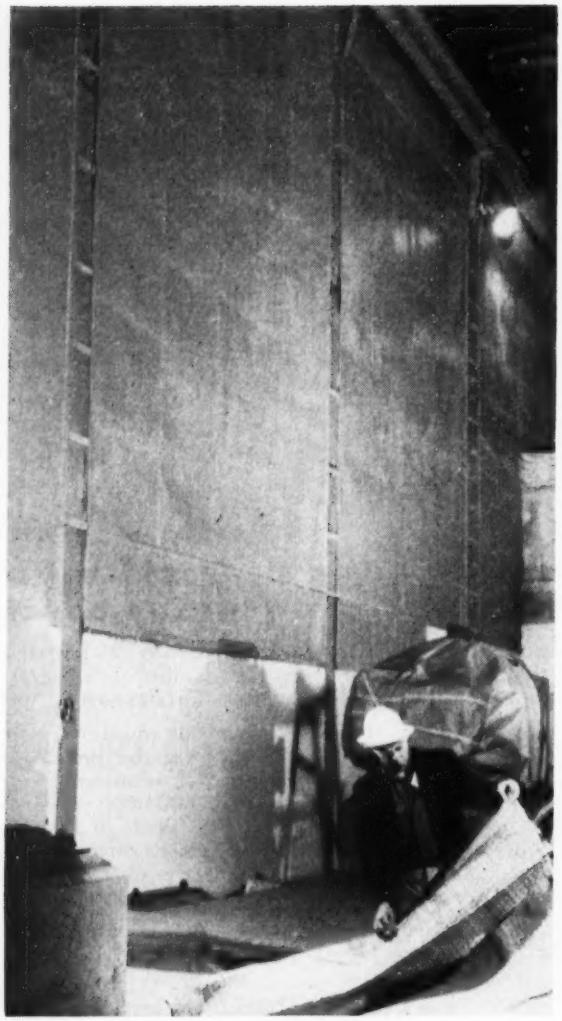
Scattered all over vast Folsom Dam are numerous Lorain shovels, cranes, draglines, hoes and clamshells. Merritt-Chapman & Scott, New York and Savin Construction Corp., Hartford, Conn. — (joint-venture contractors on $30,000,000 construction) — are long time Lorain owners. Their combined purchases total 60 Lorains — many of them now serving on Folsom. A few are shown in action — typical of the varied and demanding jobs Lorains are called upon to perform.

Lorains *do* get the call on the big jobs . . . because the men that bid them know from experience that Lorain performance will meet tight deadlines — and earn profits. And back of every bid is the fast, efficient service of a Thew-Lorain Distributor. It will pay you to base your bid on Lorains, too! *The Thew Shovel Co., Lorain, Ohio*

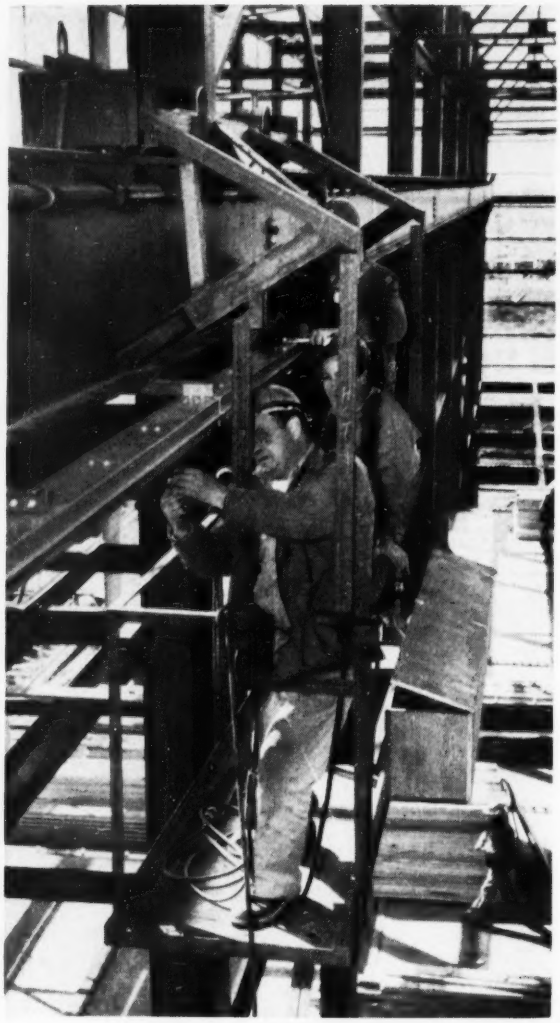
THEW-LORAIN®

A 25-ton Lorain Moto-Crane goes places — fast — all over huge Folsom Dam, to lift, load or handle scores of incoming materials.

Here, a Lorain 50-K Hoe, mounted on a crawler 14 ft. long, cleans out excavation down to bedrock for concrete spillway foundation. Lorains of all types — on crawler and rubber-tires — handled all classes of excavation.



SPRAYED PLASTIC FOR TEMPORARY WALLS — Ordinary 1½-in. chicken wire fencing becomes air-tight barrier when sprayed with 1/16-in. layer of vinyl plastic. Walls seal off completed areas.



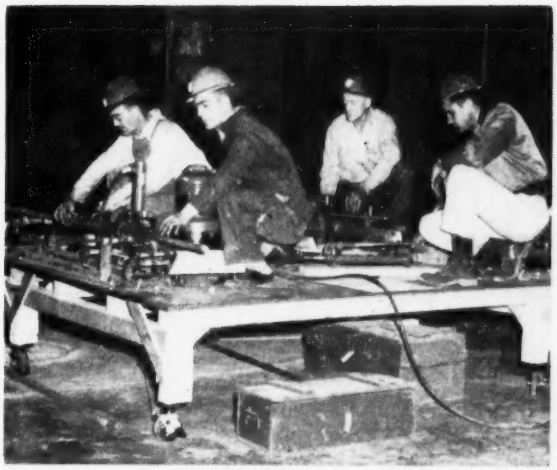
ROLLING SCAFFOLD FOR DUCT INSTALLATION — With wheels riding on overhead-crane rail, suspended platform carries electricians installing trolley duct. It is handy for painters, too.

Tricks From the Paducah Atom Plant

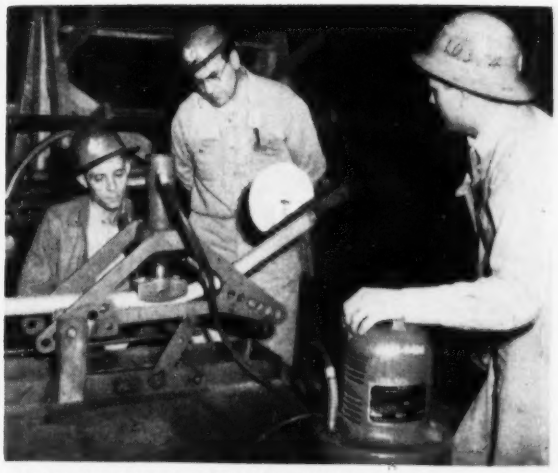
WHEN COMPLETED, the Atomic Energy Commission's $1-billion Paducah (Ky.) plant will produce U-235. But even though it is still abuilding, the huge project already has produced a goodly number of worthwhile construction ideas. A representative handful of them is pictured and described on these pages, from material furnished by AEC and its prime contractor at Paducah, F. H. McGraw & Co., of Hartford, Conn.

• **Temporary walls** are necessary to make certain areas dustproof and temperature controlled for installation and testing of equipment. These walls are made by applying, by ordinary paint-spraying methods, a 1/16-in. coating of vinyl plastic to ordinary 1½-in. chicken wire fencing. It makes a flame-resistant and air-proof barrier that is flexible, so not easily broken. When no longer needed, the "Cocoon" wall is rolled up and re-used in other buildings, or is cut up for tarpaulins. Protective Coatings, Inc., Tampa, Fla., installs the economical barriers under subcontract to McGraw, and already has put 250,000 sq ft of them in one building alone.

• **Workshops** and other facilities are made portable because of the large areas covered by many of the buildings. For example, A. S. Schulman Electric Co., Chicago subcontractor, puts its conduit workshops on wheeled platforms. These are usually 6x12 ft, so can be moved through narrow spaces, but can be coupled to make one 12x12-ft unit. The platforms carry such things as conduit benders, power hacksaws and pipe-threading machines that can handle pipe or conduit from ½ to 4 in. in dia. Some of the tables are laid out with vari-colored radius lines for all



WHEELED TABLE FOR BENDING CONDUIT — Platform carries hand- and power-driven hydraulic benders, is easily moved where required inside large buildings. It's faster than outside shops.



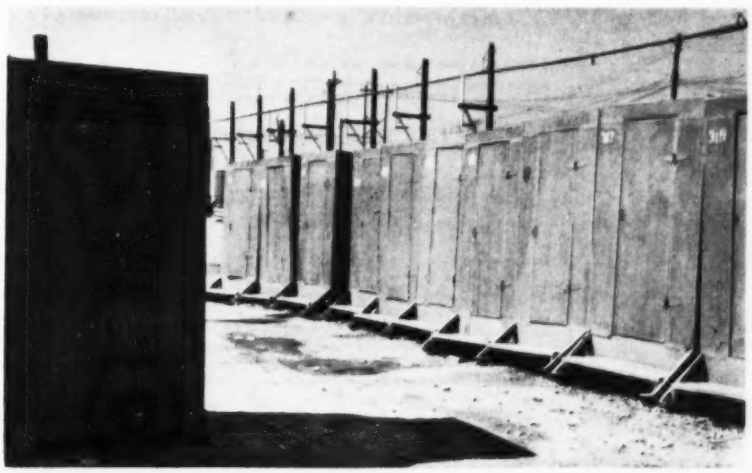
ANGLE INDICATOR FOR PIPE BENDS — Pendulum, protractor and U-hook make simple but accurate bend-angle indicator. Combined with power bender, it has speeded job considerably.

ADJUSTABLE FORMS FOR MACHINE FOUNDATIONS—C-clamps made up of angles, pipe and rods align forms through bolts in each leg. Lower bolt applies tension, upper compression.

STRADDLE TRUCK FOR STEEL DELIVERY — Modified units economically deliver large quantity of fairly small structural sections direct from storage yard to erection sites without rehandling.

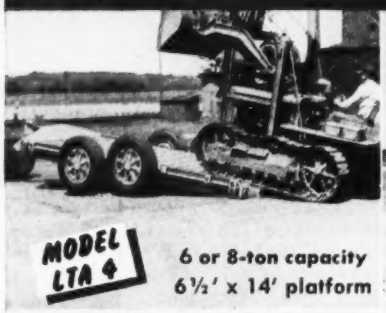
bends from 9 to 48 in.; others carry automatic angle indicators.

• **Latrines** are portable, too: Skid-mounted plywood frames with plywood walls and chemical receptacles. This last is a half section of a standard 55-gal oil drum (split lengthwise) fitted with a seat. Because the complete unit weighs only 600 lb, it is easily moved and can be hoisted to building roofs and upper floors to provide sanitary service there. The job's 460 portable latrines are serviced once a day by seven tank trucks that remove waste and recharge them with chemical solution. Leaching fields for disposal of the sewage are set in remote areas of the project. While the latrine service is supplied under subcontract by the

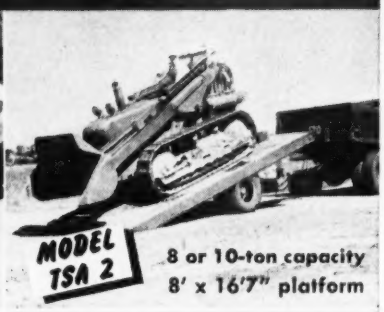


PORTABLE LATRINES FOR SANITATION — Fitted with chemical toilets, 460 of these plywood booths are moved around job site, as required. Seven tank trucks service them.

SAVE 3 to 4 hours
on every equipment move with LaCROSSE TILT TRAILERS



MODEL LTA 4 — 6 or 8-ton capacity 6½' x 14' platform



MODEL TSA 2 — 8 or 10-ton capacity 8' x 16'7" platform

MODEL DTTA 4 — 13, 16 and 20-ton cap. 8' x 18'5" platform

MODEL GTTA 4 — 14, 18 and 22-ton cap. 8' x 21'2¾" platform

Easily loaded or unloaded in 5 min. by 1 man!

With a LaCrosse Tilt Top, *your truck driver alone* can handle the time-consuming job of loading and unloading equipment. No ramps to build! No blocking or cribbing! No high-priced labor crews tied-up on non-productive tasks! Just tilt . . . load . . . and you're ready to roll in 5 minutes. LaCrosse Tilt Trailers are economical to own . . . a size and model for every need. Write for prices and free descriptive literature.

. . . also standard low-beds up to 67 tons capacity

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America's Favorite LOW-BED TRAILER

TRICKS FROM PADUCAH . . .

Continued

M. C. Nottingham Co., Arcadia, Calif., the F. H. McGraw sanitation department checks daily to assure the best possible sanitary control.

• **Test cubicles,** for calibrating and adjusting electrical panels, are also portable. The unit is a caster-mounted room, about 10x8x8, with one open side. The open side can be locked to the panel being tested to make a dust- and noise-proof enclosure with ample working space for one or two of Schulman's electricians. Inside the cubicle is a completely equipped work bench with power tools, outlets for electricity and compressed air, and other necessary apparatus.

• **Other portable equipment** includes a wheeled unit with integral winch to pull power and control cables into cubicles in various odd positions and without additional bracing or support. The top of the puller is raised against the top of the cubicle to transfer the pulling load, thus eliminating conventional floor anchors. Even the automatic submerged-arc welding machines for M. W. Kellogg Co.'s subcontract pipe installations are put on wheels to be taken directly to the work. Teamed with the mobile machines are fit-up racks for aligning straight lengths of pipe, power rolls for turning them, and positioners for complex piping arrangements. A welding head is pivoted between two positioners so fit-up and manual tacking can proceed without interruption. The machines handle both carbon-steel and nickel-lined piping at speeds of 18 to 23 in. per min.

• **Equipment foundations** require a large number of concrete bases to be poured atop floor slabs. Form panels are heavily framed ¾-in. plywood faced with cloth to eliminate rubbing. To reinforce the assembled form, large yokes or C-clamps are placed across it. Two ½-in. dia bolts in each of the clamp's downstanding legs are fastened to the panel to apply either tension or compression when one or the other is tightened with a hand wrench. Thus the form can be pulled or pushed into shape to eliminate waves and irregularities. It is even possible to re-align forms that have bulged either inward or outward during a pour. The C-clamp itself is secured so as to pre-

(Continued on page 86)

It's the 1 yd. Jaeger LOAD-PLUS

Note how weight of machine and pressure on bucket converge on the driven front wheels. Torque converter drive enables operator to apply any power needed in one fast, smooth build-up, without shifting. It's shock-free, too.

Horizontal thrust of the hoisting pistons crowds the bucket 13" forward into the pile.

Power-steered rear axle whirls loader in only 14' radius. 5-speed transmission and instant directional shift take it from there — up to 18.7 mph forward, 28.2 mph reverse.

Engine at rear counterbalances loaded bucket. It's stable.

Longer reach (24"), at higher dumping clearance (8' 2" under bucket lip, 10' 1" under hinge). Boom arms and bucket under finger-tip control.

Loader operators take to this machine like ducks to water. *They helped design it.* Catalog L100-3 will tell you why. Send for it today.

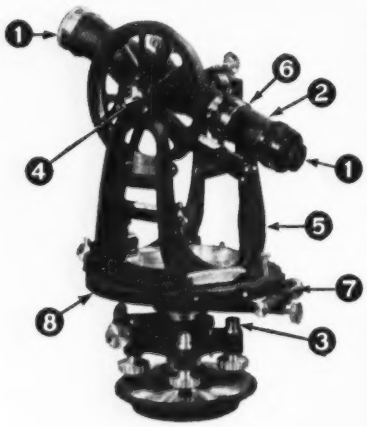
THE JAEGER MACHINE COMPANY

800 Dublin Avenue, Columbus 16, Ohio

AIR COMPRESSORS • PUMPS • MIXERS • TRUCK MIXERS • PAVING MACHINERY

Ask the man behind the "gun"...

How these 8 major design advances make White the top engineers' transit



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TOMORROW as in the past, White Engineers' Transits will continue to offer the most up-to-date design and construction features. This results in greater accuracy, longer instrument life, easier use. To get all the details write for Bulletin 1053. DAVID WHITE CO., 343 W. Court St., Milwaukee 12, Wis.

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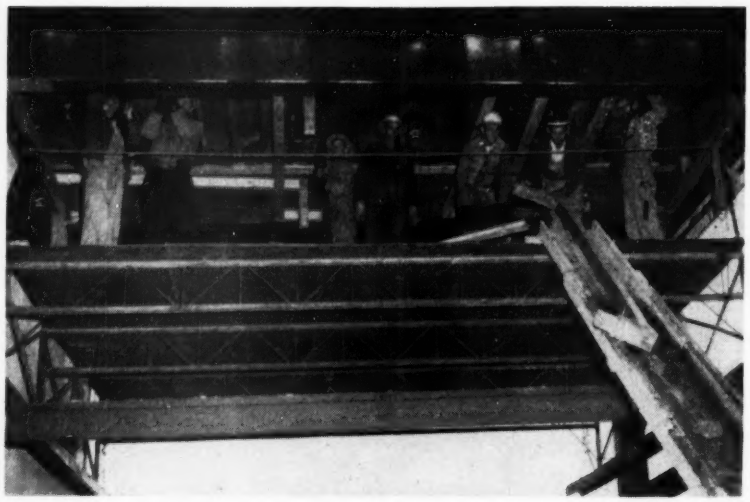
We offer the most expert REPAIR SERVICE on all makes, all types of instruments.



SUSPENDED PLATFORM FOR STRIPPING FORMS—Timber bracing and metal forms are chuted to ground from stripping platform. Platform rolls on 60-ft long I-beam tracks. Tracks, in turn, are suspended from rollers on building's struts, so can be moved too.

DRILLED HOLES FOR BUILDING FOUNDATIONS—Reamed and belled shafts save 50% in time over spread footings for duplicate buildings. Auger (rear) cuts vertical shaft, then cutter-bucket bells it. Temporary metal casing protects hole until it's concreted.

vent any form movement and to eliminate other side bracing. Easily erected and stripped, the clamp-type forms have proved to be time, labor and money savers.

• **Temporary heating** for buildings still under construction is necessary to maintain a constant 70 deg temperature for proper pipe installation. For this, a simple system is used that reduces costs about 60%, compared to conventional temporary boilers or unit heaters. Here's how it works: Overhead ducts of the building's permanent ventilation system are installed in the early stages of construction, temporary heating coils are placed in the filter rooms of this system, and warm air is blown through the ventilation ducts to keep the entire

building at correct temperature. It saves tremendous quantities of pipe and fittings, as well as many man-hours of skilled tradesmen necessary to install, and later remove, a temporary steam heat system.

• **Other devices and techniques** that are cutting costs or speeding the F. H. McGraw Co.'s completion of the Paducah plant include movable suspended platforms for stripping slab forms and installing ducts, straddle trucks for handling structural steel, standard roadbuilding methods and equipment for constructing floor slabs, and drilled foundations. Holes for these are drilled 13 to 20 ft deep, with shafts up to 5½ ft in dia and with bases belled out to as much as 13 ft.

Break-In That New Tractor

THAT NEW TRACTOR just delivered to you deserves a good start in its life. You can help launch it on a better and longer life by properly breaking it in.

Generally, the distributor will give the necessary break-in instructions when the tractor is delivered. Follow his recommendations.

Make sure your tractor does not still have the ship-away oil for lubrication. This is fine for storage purposes, but put in break-in lubrication if you plan to work the tractor immediately.

When the tractor gets on the job, it's important to make sure the engine is completely warmed up. The engine should run at a fairly fast idle.

Once the engine is completely warmed, it's excellent practice to give the tractor an exercise run. This is a good safety measure.

Your tractor is now ready to work, but don't give it the works just yet. Operate it in a gear which will not pull the engine below rated speed.

The period of moderate operation is usually about 30 hr. Traveling speeds should be kept moderate to give track rollers and chassis assemblies a chance to seat themselves and take on wear hardening.

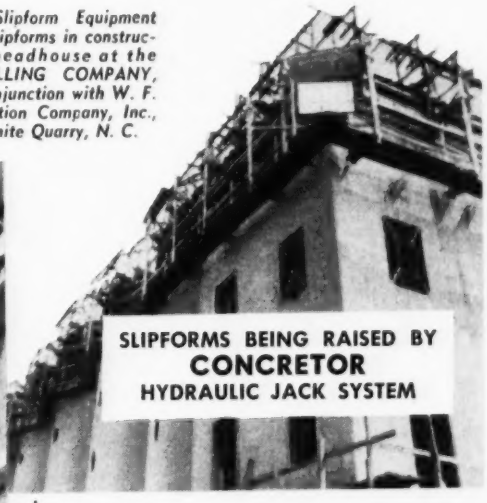
It really pays to give your new tractor a break on the break-in period. Common sense during break-in periods is just like money in the bank.

CONCRETOR SLIPFORM EQUIPMENT

WITH HYDRAULIC JACKS

Typical CONCRETOR Slipform Equipment showing use on wooden slipforms in construction of 12-bins and headhouse at the WILKENS-ROGERS MILLING COMPANY, Washington, D. C., in conjunction with W. F. Brinkley & Son Construction Company, Inc., General Contractors, Granite Quarry, N. C.

Yoke leg on waler. Arrow indicates upper part of jack.



For further information or to see CONCRETOR EQUIPMENT in operation, send coupon . . .

Standard CONCRETOR machines in various fixed diameters may be purchased or rented for single units or silo work. Slipform equipment in conjunction with wood forms is available on a rental arrangement for all types of construction such as apartment houses, multiple silo groups, industrial plants, etc. Our Engineering Department will be happy to quote you on the basis of prints submitted.

B. M. HEEDE, INC., 80 Broad St., New York 4, N. Y.

Have checked the service which you can render without obligation on my part.

☐ Send me detailed information on CONCRETOR Equipment.

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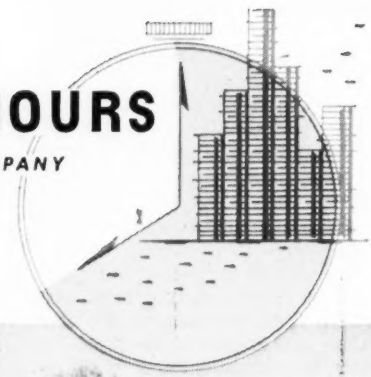
DOMOR ELEVATING GRADER

SAVES $103 EVERY 8 HOURS

FOR HART CONSTRUCTION COMPANY



Jack Hart, Omaha, Nebraska Contractor, is really saving money on a 50,000 cubic yard fill job by replacing single-purpose loading equipment with his one-man operated Domor Elevating Grader.

The Domor, working in a borrow pit one mile away, loads into trucks which deliver 2400 cubic yards in 8 hours to the new Missouri River power plant site of the Omaha Public Power Company.

The Caterpillar No. 12 and Domor Elevating Grader attachment loads in second gear—leaves borrow pit smooth and level—permits trucks to take full advantage of their speed, assuring fast, smooth cycle time. *Result: Lower cost per yard for Hart Construction Company.*

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NEW large capacity *fresh air* PORTABLE HEATER

DELIVERS 420,000 B.T.U. per hr.

Model ID is an entirely new Silent Glow Portable Heater, designed to produce an abundance of heated fresh air where you want, when you want it. It starts at the flick of a switch, and is fully automatic with thermostatic control and with special electrical equipment designed for outdoor operation. Hence it can be used anywhere at any time that quick heat is needed.

Model 2, shown above, delivers 420,000 B.T.U.'s per hour; Model 1, slightly smaller, delivers 310,000 B.T.U.'s per hour. Both heaters are indirect fired type and have a stainless steel combustion chamber designed for the highest possible efficiency for indirect heating. Light in weight (only 350 lbs.) for easy portability. . . . Send in the coupon below for the complete story.

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Please send me information on the ID Heater.

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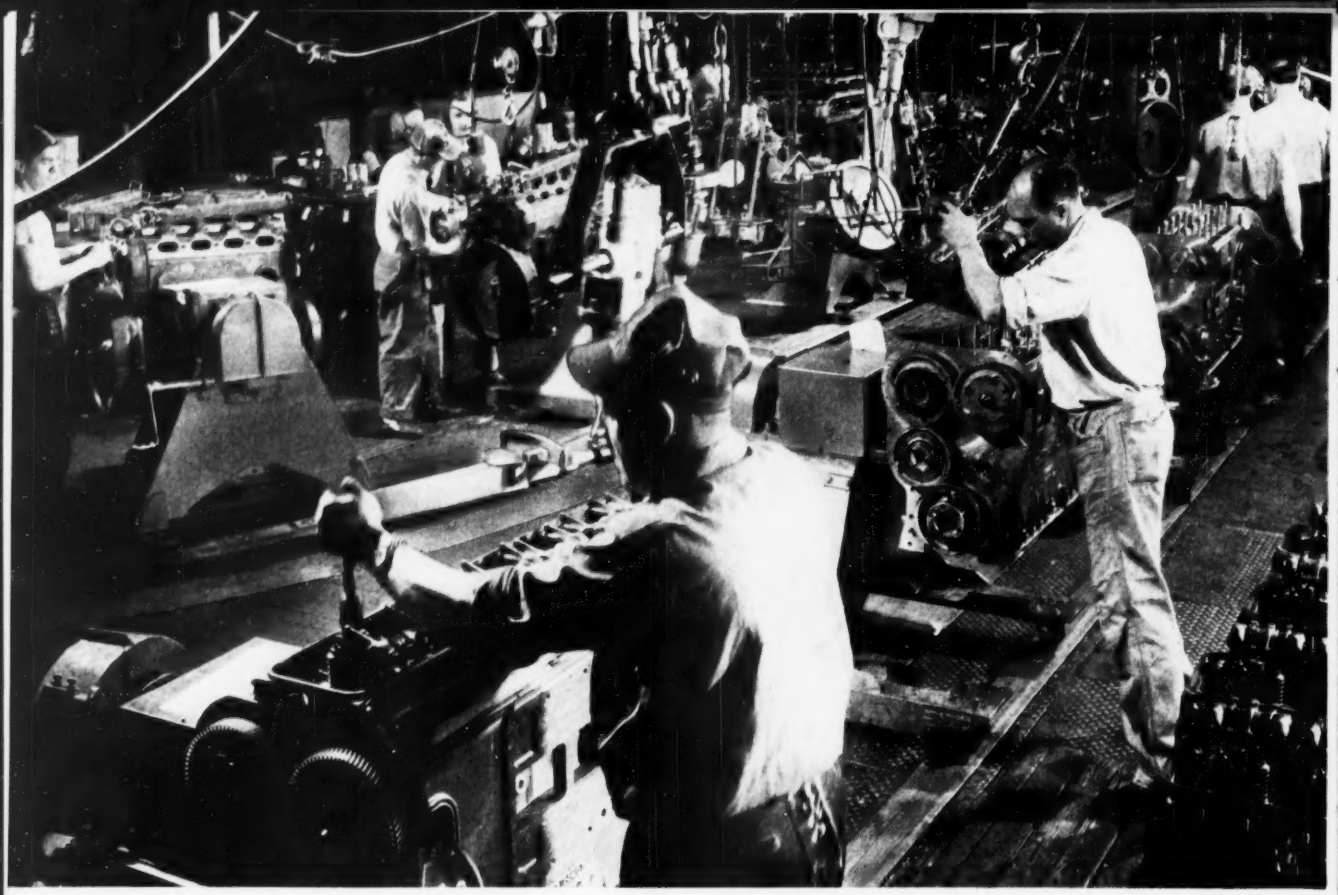


Key to Low-Cost Horsepower is efficient, economical mass production. Basic GM Diesel engines are built up on this modern assembly line. The engines are then transported automatically by overhead cranes to the dynamometer room for testing and run-in. Some then go to other lines where engine bases and accessories are added and multiple-engine units are assembled. All GM Series 71 engines have the same size bore and stroke—thus many parts are standardized and interchangeable from a 2-cylinder engine to a 24-cylinder 840 H.P. "Quad."

Inside Reasons Why GM Diesel Gives You Lowest-Cost Horsepower

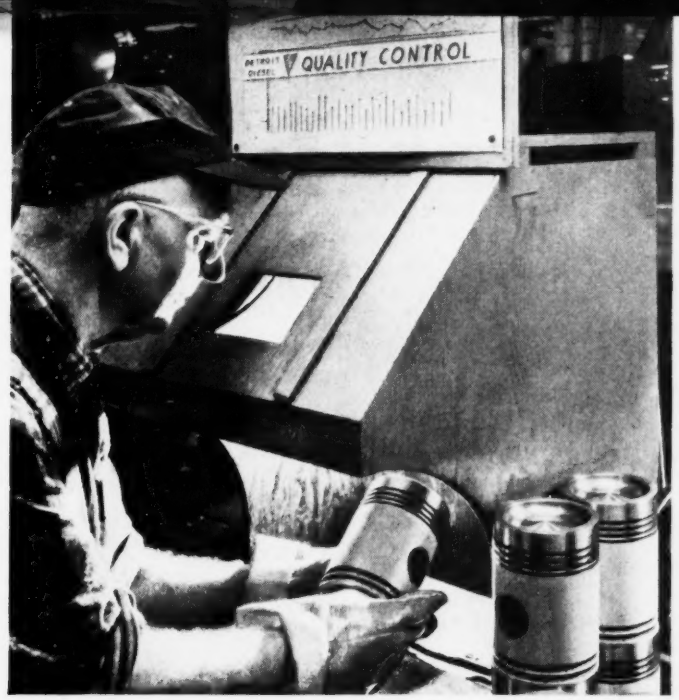
If you were to visit the Detroit Diesel plant you'd see reasons for the widespread acceptance of General Motors Diesel engines—reasons why these engines today power more than 750 different models of equipment.

The inside story of GM Diesel is *quality*—quality that starts with the unmatched simplicity of GM Diesel's 2-cycle design—quality that comes from continuous research and constant improvements by GM engineers—quality assured by precision manufacturing methods and checked by the most rigid tests at every stage of production.

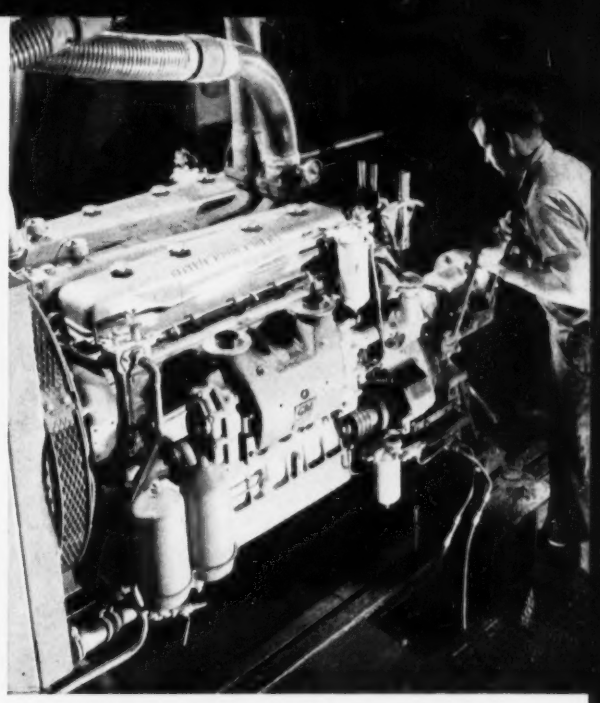
To users, it means reliable Diesel power at the *lowest cost per horsepower hour*—lower initial cost, lower parts cost, lower maintenance cost.

DETROIT DIESEL ENGINE DIVISION
GENERAL MOTORS • DETROIT 28, MICHIGAN

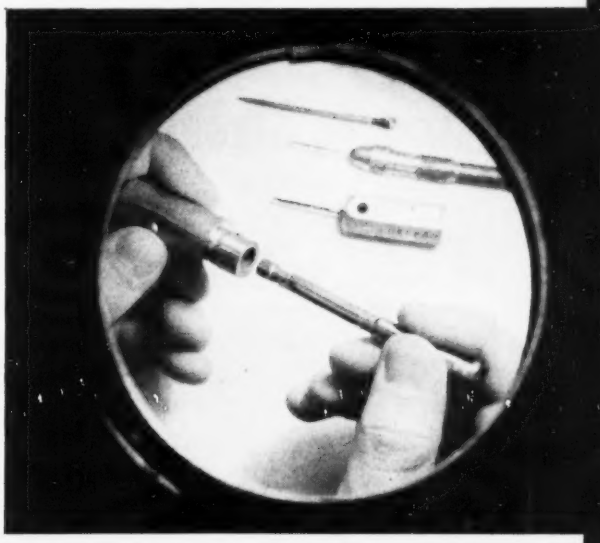
Precision Inspections are made at many points along the line in the production of a GM Diesel engine. These men are using dial gauges to check exact location of the flywheel housing with relation to the crankshaft flange before mounting the engine flywheel.



Final Piston Inspection—Using a weighing scale, "black light" magnetic inspection and numerous precision gauges, this veteran inspector carefully rechecks each and every GM Diesel engine piston. "Quality Control" like this is a good reason for standardizing on *both* GM Diesel engines and *genuine* GM Diesel parts.



"Twin" Test—GM Diesel "Twin" being given final test on typical dynamometer test stand to assure that it delivers specified horsepower. Each of the two engines in the "Twin" has already undergone basic dynamometer testing, but all multiple engine units, generator sets, and power units receive this additional final test.



30 to 60 Millionths of An Inch clearance between injector plunger and bushing. Operator looks through magnifying glass to assemble two perfectly mated parts which work as a pair for life. The working area is completely air conditioned to protect the assembly from foreign particles.

It pays to STANDARDIZE on

GM
GENERAL MOTORS
DIESEL POWER

Single Engines . . . 16 to 275 H.P.
Multiple Units . . . Up to 840 H.P.

Gear Inspection—On this instrument the profile of gear teeth is regularly inspected and electrically recorded on a tape. Other machines in the gear inspection room check all operating characteristics of our all-steel gears to assure smooth running and maximum life.

Riprap weir takes high water across rolled earthfill, helps tunnels . . .

Divert Stream Over Dam Under Construction

By J. R. STEPHENS
Resident Engineer for Corps of Engineers, U. S. Army
Blakely Mountain Dam

OPEN GATES over 5½-ft twin bores diverted low water until closure, when they were lowered and sealed. Gates are outside concrete plug placed into upstream portal of power diversion tunnel.

STREAM DIVERSION during construction of Blakely Mountain Dam, a compacted earthfill structure on the Ouachita River near Hot Springs, Ark., was handled in an unusual manner, due to the protracted nature of building which required several years.

Blakely Mountain Dam is a Corps of Engineers project designed for flood control and power generation. It is 230 ft high, 1,200 ft long, with side slopes varying from 1 on 2½ to 1 on 3. It receives water from an area of approximately 1,100 sq mi, and its storage capacity is 1,900,000 acre-ft. The power plant will have two 37,500-kw generators.

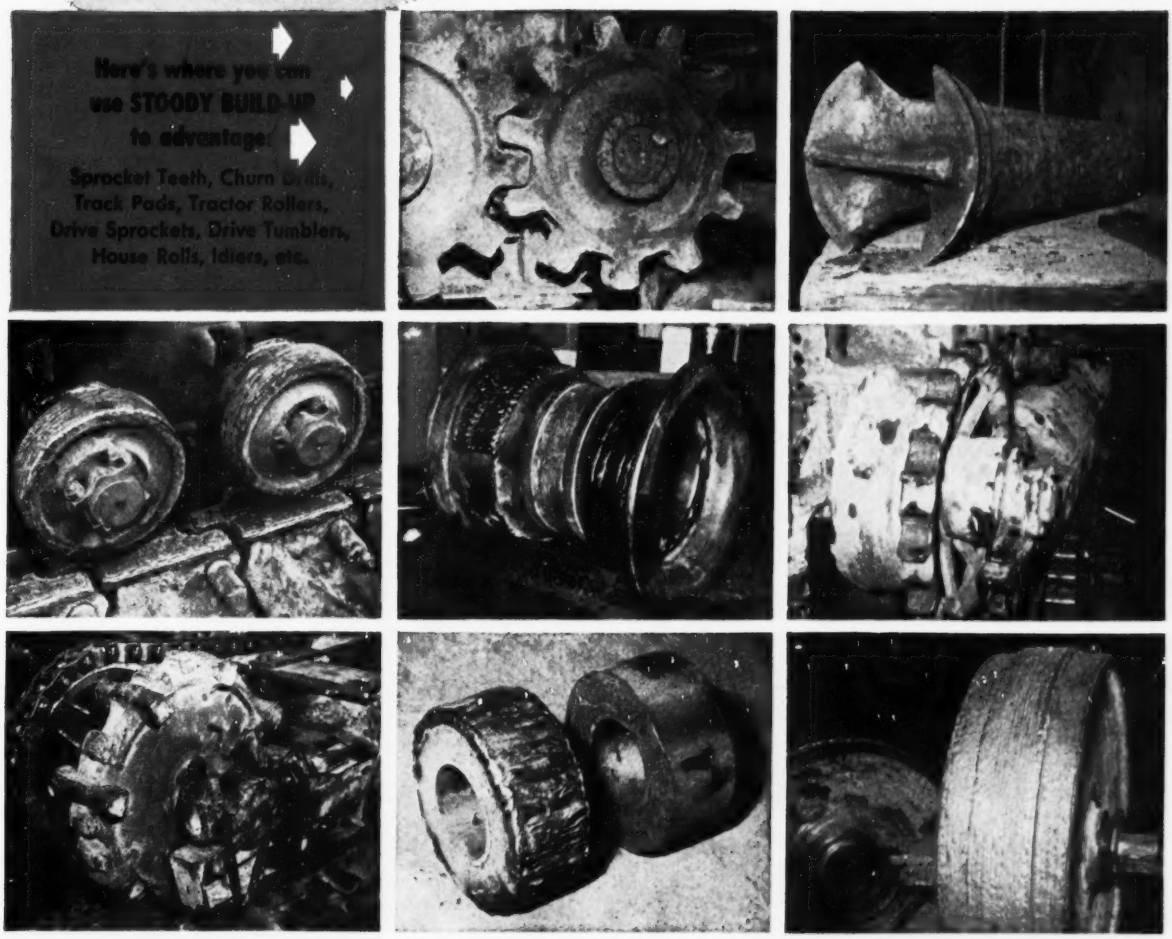
• **Water will flow** to the turbines through a 24-ft steel penstock inside a 30-ft concrete-lined tunnel. A 19-ft concrete-lined tunnel will handle regulated discharges of flood waters. Intake towers at El 480 house power bulkheads and flood control gates. Dropdown tubes connect the towers with the tunnels which discharge at El 400.

During construction of the dam, both tunnels were used as stream diversion outlets by connecting them to diversion tunnels leading to portals some 800 ft upstream of the permanent intake towers. Diversion tunnels later were plugged with concrete when it came time to fill the reservoir. The flood control tunnel has a permanent stilling basin below the dam. But

(Continued on page 94)

AT LAST! STOODY BUILD-UP

A real build-up material that has what it takes!


Here's where you can use STOODY BUILD-UP to advantage:
Sprocket Teeth, Churn Drills, Track Pads, Tractor Rollers, Drive Sprockets, Drive Tumblers, House Rolls, Idlers, etc.

USED TO BE that anything you could weld with was considered good enough for a build-up—high carbon, mild steel or what have you.

IT'S NOT SO! A *real* build-up material *has* to have "guts"; it has to have high tensile strength, resistance to cold flowing, rigidity, and sound deposit characteristics that will enable it to properly support the final passes of hard-facing alloys. Those properties are just exactly what you get in the new Stoody Build-Up electrode.

STOODY BUILD-UP is for use on carbon and low alloy steels preliminary to hard-facing. For some uses it is recommended as a final overlay—steel shafts that require a machine finish, gears of many types, tractor rails and shovel pads. These and other typical applications are illustrated above.

See your Stoody dealer or write for special folder describing Stoody Build-Up. (Consult the "yellow pages" of your phone book.)

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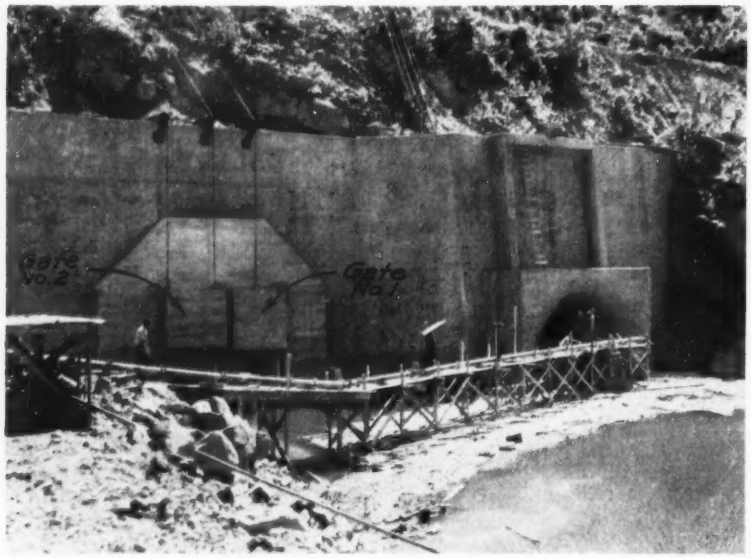


PORTALS TO DIVERSION TUNNELS. After 30-ft power diversion tunnel at left had been plugged (gates left open), 19-ft tunnel at right was closed with big steel gate and concrete behind it. Gates at left were controlled by cables to hand winches on bank above.

the power tunnel had only a temporary stilling basin, since the power plant was to be constructed in the same area after completion of the embankment.

Year-by-year appropriations of funds for the work influenced scheduling of work to some extent. Construction of power and flood control tunnels—plus their temporary diversion tunnel adits—was completed in June 1950.

Construction of the dam embankment and permanent intake structure and plugging of diversion tunnels were completed essentially in December 1952. Work was begun on the power plant last January and is slated for completion in January 1955.

• **Stream diversion was somewhat different** because it was impractical to build the earth embankment sufficiently high in one dry season to prevent overtopping during the following wet season. The 30- and 19-ft tunnels were the only means of bypassing flood water. And it was necessary to maintain some stream flow for the operation of an existing hydro plant downstream.

Embankment construction was accomplished in several stages. First, an upstream cofferdam about 45 ft high and a downstream cofferdam about 20 ft high were built to protect the dam embankment foundation area during the dry season.

The embankment was built up to El 430 in the first dry season. To protect this rolled fill against erosion by flood waters during the next wet season, the contractors laid a riprap weir extending 300 ft along the downstream shoulder of the embankment. The 1 on 3 downstream slope of the dam and weir abutments were paved with grouted riprap 5 ft thick. This overflow protection work was completed by placing a 3-ft blanket of dumped riprap on the weir fill beginning at the downstream slope and extending 250 ft upstream.

In the next low-water season weir and upstream riprap were removed. The 5 ft of grouted riprap on the downstream face of the dam were left in place as permanent slope protection. Then the embankment was built up another 80 ft to El 510. This height provided sufficient reservoir storage to prevent further overtopping of the dam—with both diversion tunnels open.

• **Closure of diversion tunnels** came in the third work season when the embankment was completed to final grade at El 616. Tunnel closure, coordinated with building up the earthfill, required concrete plugs at the upstream portals and longer and more sub-

PERMANENT INTAKE STRUCTURES rise against upstream embankment of earthfill dam essentially completed. Intakes, one for power and one for flood control, connect with two tunnels leading to powerhouse and stilling basin on the other side. Diversion tunnel on right has been sealed, and river flow during dry season passes easily through two small gated portals prior to filling of reservoir.

stantial plugs were diversion tunnels and dropdrown tubes intersected at the permanent tunnels.

First step was the driving of a wood needle-beam cofferdam in front of the entrance to the power diversion tunnel, diverting all river flow through the flood-control diversion tunnel. The portal to the power diversion tunnel then was plugged with concrete, with the exception of two built-in 5½-ft gated openings.

Gates for closure of these two openings were constructed in-place, made of concrete, with metal seals, and were suspended in open position by cables controlled by hand-operated hoists on the river bank above. The gated openings permitted sufficient water flow to maintain power plant operations and other services on the river below Blakely Mountain while the dam was filling to the level of the permanent intake structures.

Next, the needle-beam cofferdam was pulled out and a large steel gate closed inside the upstream portal of the flood-control diversion tunnel. A concrete plug 25 ft long was poured behind the gate to seal this tunnel at the upstream end. Pouring of its concrete intersection plug (where diversion tunnel met permanent flood-control dropdown tube) completed the seal of this tunnel.

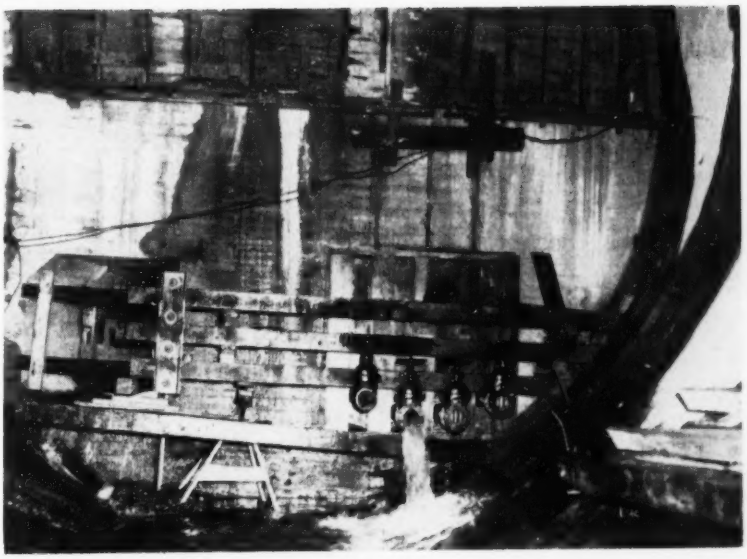
• **A sticking gate** enlivened operations for a while during final cutoff of diversion water.

Due to an extremely dry summer, flow in the river was less than 550 cfs. During these low stages, it was decided to close Gate No. 1 since the other opening would be sufficient to discharge the full river flow with little effect on the river stage.

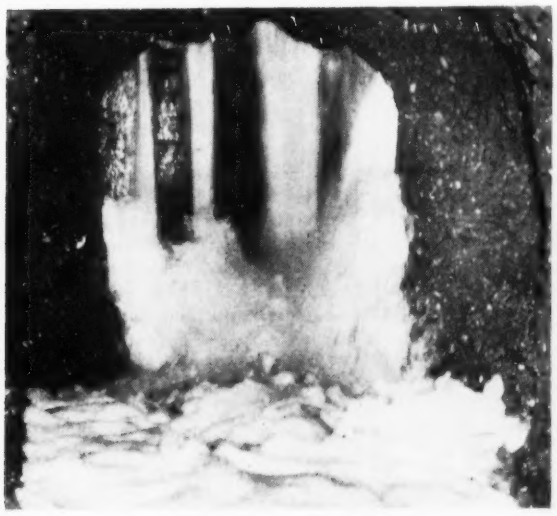
Gate No. 2 was kept open until the wet season started and until the reservoir had filled about 35 ft above the opening. At this stage, Gate No. 2 was lowered 2 ft, leaving an opening of 3½ ft. This partial closing of the opening was made to conserve as much water as possible in order that the reservoir might be near maximum power pool at time of plant completion.

The day after the partial closing, the reservoir rose another 30 ft due to heavy rain. Gate No. 2 was lowered another foot, leaving only a 2½-ft opening. Eight days after the second partial closing, the reservoir had filled another 23 ft and had reached El 488, a stage 8 ft above the invert of the permanent intake towers. This stage was sufficient for a 550-cfs discharge through the flood-control tower so that final closure of the second 5½-ft opening was made.

When Gate No. 2 was lowered



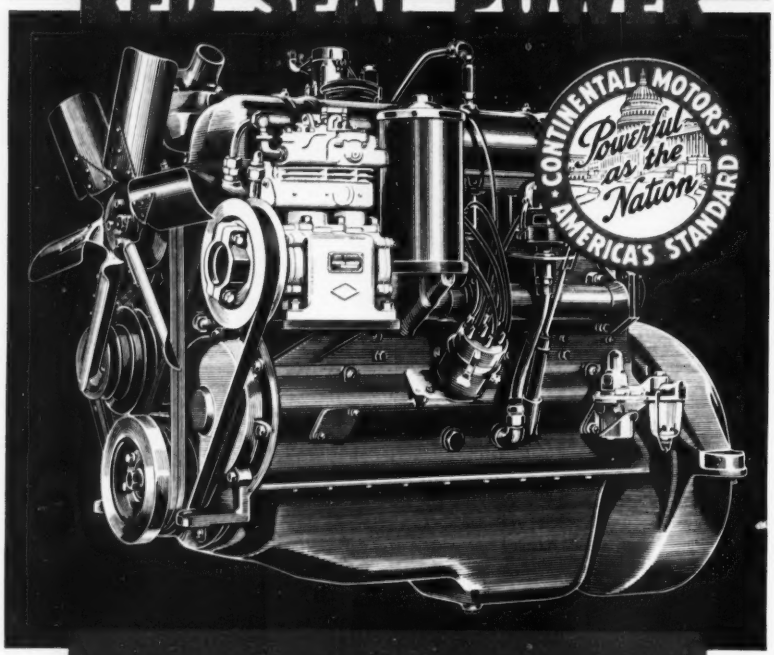
LEAK PAST GATE NO. 2 was halted by steel bulkhead placed across downstream opening inside tunnel. Four 6-in. valves were closed gradually and pressures on both sides of gate began to equalize, allowing it to close. Note tunnel from Gate No. 1 at left.



WATER FOAMS DOWN TUNNEL behind Gate No. 2 as it comes leaking through at 10 cfs. Note erosion of concrete which was discovered by engineers investigating effects of sticking gate.

TEMPORARY STILLING BASIN at end of diversion tunnel was ripped out and scoured 20 ft deep during wet season. This is future site of powerhouse, made engineers change foundation design.

ENGINEERED TO OUT-PERFORM
. . . and BUILT TO LAST
CONTINENTAL
RED SEAL POWER



28 BASIC MODELS
FOR TRUCKS AND BUSES

For more than 50 years, Continental has been engineering power plants to do more useful work per pound of engine weight, and building them to run longer with less time out for repairs. Materials flow more steadily and at lower ton-mile cost, when they move to the job in trucks with dependable Red Seal power. And the range of the Red Seal line—28 basic models, Diesel and gasoline—assures exactly the right engine for every commercial transport job.

Continental air-cooled industrial engines, 2, 2½ and 3 h.p., are available in horizontal and vertical shaft types, for lawnmowers, garden tractors, pumps, and other applications. For information, address Air-Cooled Industrial Engine Division, 12800 Kercheval Avenue, Detroit 14, Michigan.

Continental Motors Corporation
MUSKEGON, MICHIGAN

OVER-DAM DIVERSION . . .
Continued

all the way, it was noted from a measuring device on the control cables, that the gate did not make full closure by about 5 in. This meant that top and bottom metal seals on the gate overlapped the seals on the opening by only 1 in. and it was probable that neither the top, bottom, nor side seals were in contact with seals around the opening. An investigation of leakage past the gate was made by entering the tunnel from the downstream end. It was found that Gate No. 1 was leaking very little, only a few gal per min, but that Gate No. 2 was leaking about 10 cfs.

Also, considerable erosion of concrete had occurred just downstream of Gate No. 2. Due to the excessive leakage around the gate, it was not possible to make an accurate determination of the damage caused by cavitation. Particularly, it was not possible to determine definitely that the concrete around the seals of either the water passage or the gate was unimpaired.

• **Cavitation inside the 5½-ft opening** presented a potentially dangerous situation in that it might develop further with time and under greater water heads. To insure the safety of the gate, a steel bulkhead designed to withstand a pressure of 70 psi was constructed across the downstream end of the 5½-ft opening. The bulkhead was fitted with a rubber seal and four 6-in. valves to discharge the leakage during construction.

After the bulkhead was in place, two of the valves were closed completely, and closure of the other two started. When they were about half closed and considerable pressure had been built up between the bulkhead and the gate, a part of the pressure on the concrete gate was relieved and it closed completely. At about the time the concrete gate closed, the rubber seal on the bulkhead began to leak due to unevenness in the concrete surface on which it was seated.

After the concrete gate closed, leakage reduced to about 1.5 cfs, indicating that both the seals on the gate and those on the plug were in good condition. Leakage of only 1.5 cfs would be unlikely to cause further cavitations, since the chamber between the gate and steel bulkhead could be kept full of water and under pressure. Had the

(Continued on page 98)

S-T-R-E-T-C-H

your budget dollar on every curb, gutter and sidewalk job

Use BLAW-KNOX UNIVERSAL FORMS

FOR FASTER, BETTER LOWER-COST WORK

EVERY dollar ear-marked for curb and gutter work goes farther . . . and yields more profit when you use Blaw-Knox Universal Steel Forms. They give you the fastest, most economical method of forming concrete curb, curb and gutter, integral curb or sidewalks you ever saw! One set of Blaw-Knox Steel Forms can handle *every* job from simple straight work to serpentine or curved shapes, without the expensive carpentry that cuts profits. They save on costly materials, too. Easy to set and strip, they get the job finished on schedule and well within your estimate. You can use them repeatedly in combinations to fit every requirement. Costly hand finishing is greatly reduced and finished jobs have a smooth perfection impossible to achieve with wood forms. Form maintenance is practically non-existent.

Find out about the Blaw-Knox "Complete Package" of Steel Forms

Here's every type, shape and size of form you need for low-cost construction of concrete curb, curb and gutter, integral curb and sidewalk, all in one convenient "package". Start your set of Blaw-Knox Steel Forms *now* . . . add to it at any time to meet future requirements. See your Blaw-Knox distributor today for complete details, or write for Bulletin 2259.

Straight Curb Forms for curb with both faces vertical. Auxiliary bracing system provides lateral stability.

Curb and Gutter Forms for combination concrete curb and gutter when curb is battered.

Sidewalk Forms are available for any required width or thickness of sidewalk.

Flexible Steel Radius Forms for curved work of variable radius.

BLAW-KNOX HEAVY-DUTY FORMS

FOR ROADS AND AIRPORTS

Especially designed to meet requirements for thicker paving slab for modern airports, or carry the load of heavy modern road-building machinery, Blaw-Knox Heavy-Duty, Self-Aligning Steel Paving Forms save money on every job. The exclusive self-aligning feature alone reduces form setting costs to the minimum! Write for Bulletin 2370 or see your Blaw-Knox distributor.

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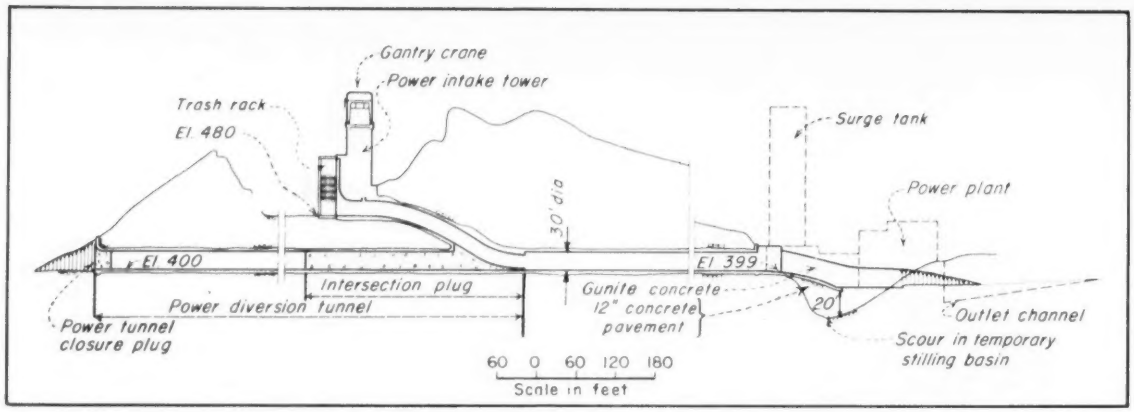


DESIGN OF DAM and related components made clear in a sketch. Temporary extension of power tunnel became a diversion tunnel. Flood control tunnel was alongside, and both now are plugged. Power plant and surge tank have not yet been completed.

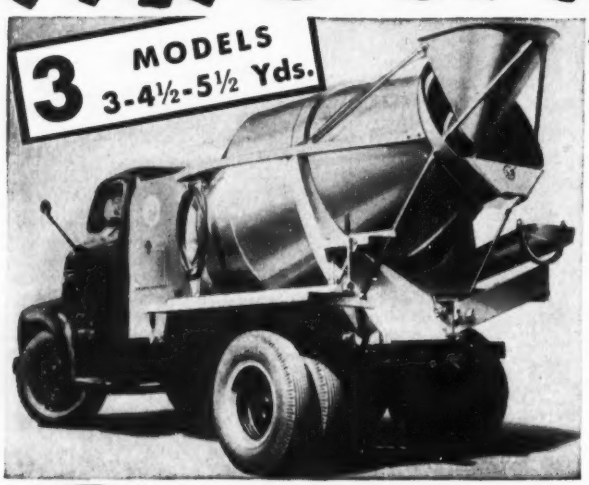
rubber seals not started leaking, complete closure of the valves would have been made in order that leakage around the gate could be reduced some more.

The 1.5-cfs leakage did not cause any special problem in constructing the intersection plug. Even though leakage around the gate was not stopped completely, the steel bulkhead served the purpose of closing the gate and insuring closure safety until the intersection plug could be completed.

• **Diverting flood waters** over partially completed earthfill embankment during construction of a dam is not new but, apparently, its use in the U. S. has been limited. Although diversion at Blakely Mountain was carried out as planned, it was accompanied by some unpredictable incidents that had to be taken in stride.

First, the upstream cofferdam was overtopped by an "out-of-season" flood during the first working season and prior to completion of the embankment weir and downstream slope protective works. Embankment damages amounted to $150,000 and delayed

PAYS OFF WITH BIGGER PAYLOADS



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Construction Machinery Co's., Waterloo, Iowa

MC TRANSCRETE TRUCK MIXERS

completion of the first stage construction by three weeks. The cofferdam hurriedly was raised several feet in an all-out effort to prevent overtopping as the flood developed.

This work was limited by heavy rains. However, due to the rapid rise of the river, it is doubtful that the overtopping could have been prevented even under good working conditions. In restoring the cofferdam it was raised 5 ft above original grade to afford greater protection during the extended construction period.

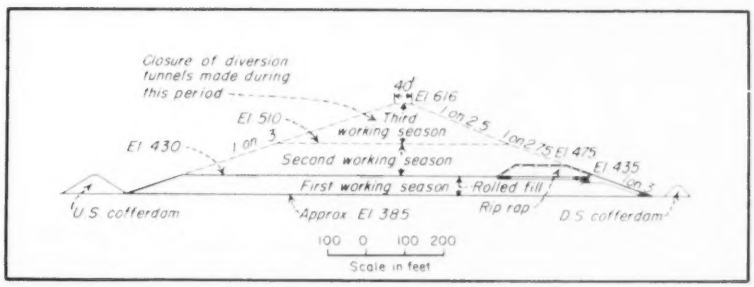
A second delay occurred in the quarrying of stone for the embankment weir and slope protective works. Local quarries were opened up as a matter of economy, but they proved more difficult to operate than contemplated, and the production rate was less than estimated. As a result, and through delays caused by cofferdam overtopping, the weir and other protective works were not completed until after the beginning of the wet season but, no further flood flows occurred prior to completion of the first season's work.

Overflow weir and slope protection works were designed for overtopping by some 20 ft of water. As it happened, the following winter and spring were unusually dry and the embankment overflow feature of the diversion plan did not get a real test. The weir was overtopped on only two occasions, and then to depths of only 6 or 7 in.

In Charge

Blakely Mountain Dam is under the general supervision of Brig. Gen. P. A. Feringa, division engineer, Lower Mississippi Valley Division, and under the direct supervision of Lt. Col. George F. Dixon, district engineer, Vicksburg District. R. C. Baker is chief of the construction division and the author is resident engineer on the project.

Contractors employed for the various features of the work were: Spillway, Clark and Farrell, Memphis; tunnels, United Concrete Pipe Corp., Charles T. Horney, Inc., Stolte, Inc. and Ralph H. Bell, Oakland, Calif.; embankment and intake structures, Groves, Lundin and Cox, Inc., Minneapolis; power plant, Al Johnson Construction Co., Minneapolis.



EARTHFILL EMBANKMENT was completed in three working seasons. Special riprap weir was constructed to carry flood water over top of first season's rolled fill during wet weather.

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Houston Contracting Company of Houston, Texas, uses Shell Rotella Oil on Caterpillar Diesel D8 tractors. The photograph shows work on the McCamey-Houston, Texas, pipeline extension

FROM COAST TO COAST, operators of heavy-duty construction equipment report sizeable reductions in engine-parts wear with Shell Rotella Oil. That's because the balanced alkaline fortification in Shell Rotella Oil fights one of the chief causes of excessive engine wear—cylinder and bearing wear caused by acidic products which result, for example, from incomplete combustion.

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A MESSAGE TO AMERICAN INDUSTRY • ONE OF A SERIES

BRITONS CAN HAVE PROSPERITY —If They Want It

What is required to get Britain, our key ally in the grand alliance of the free world, firmly back on her economic feet? The purpose of this message is to throw light on this crucial problem, which afflicts our other European allies also.

At the moment, Britain is enjoying a respite from the economic crises (of 1947, 1949 and 1951-52) which have plagued her postwar course. This respite may well continue for some time. But almost no one whose judgment is trustworthy believes that Britain has acquired sufficient economic strength to safeguard her against further economic crises in the years immediately ahead.

Two British Views

New and clear light on what should be done to that end has recently been shed by two noteworthy British publications. One is a book, "We Too Can Prosper," by Graham Hutton, distinguished British economic writer and administrator. The other is an article, "The Riddle of Prosperity," published by THE (London) ECONOMIST, Europe's most eminent economic journal.

Combined, these two publications present in sharp relief the basic problem that must be handled successfully if Britain is to be safely solvent. As is implied by its title, ***the Hutton book demonstrates that Britain can be made prosperous by readily feasible procedures, patterned on what has been done in the United States, to increase its industrial efficiency. But, says THE ECONOMIST, with Mr. Hutton's book in mind, this is not the most basic problem, which is, "How shall we make the British people determined to be prosperous?"*** This is a problem of incentive or motivation.

Compared with that of the United States, average industrial efficiency in Britain, as in most of Western Europe, is low. In his book Mr. Hutton remarks that "fifty years ago an American industrial worker turned out roughly the same amount in a day as his opposite number in Britain, Germany or France. . . . Today, he turns out from two to five times as much."

In large part it is this lag in output per hour or "productivity," as the technicians call it, which makes Britain and other key countries in Western Europe a continuing prey to economic crises. Moreover, the great disparity in productivity between the U.S.A. and most

(Continued on next page)

of Western Europe is a major barrier to knitting the free world into a smoothly working economic whole. As one observer put it, "when the American economy catches a cold, the European economy gets pneumonia." This is largely because Europe is so much weaker in productive strength.

No Shortage of Knowledge

Yet the knowledge which would enable the countries of Western Europe, and particularly Britain, to increase their industrial productivity has been mobilized and is readily available to them. It is with this process for Britain that Mr. Hutton's book is concerned. In the book he summarizes the findings and conclusions, virtually all of them unanimous, of 66 teams, composed of British industrial managers, technicians, shop workers and labor leaders. Over a period of three years these teams completed a comprehensive series of inspection and study trips in the United States under the sponsorship of the Anglo-American Council on Productivity. The product of that effort, he remarks, is "a set of documents the like of which, on such a scale and of such practical value, has never been seen in the history of international and cultural borrowing."

Psychology the Key

From study of these documents, Mr. Hutton concludes that better capital equipment is the key technical ingredient of higher industrial productivity in Britain, and constitutes "the most urgent . . . need of British industry." But he finds that ***even without new capital equipment a "15% rise in productivity can still be achieved by reorganization of work," and that such an increase would "solve Britain's chief social and economic problems."***

Then why is not such an increase in productivity, demonstrated by the Anglo-American productivity teams to be so clearly within technical grasp, promptly forthcoming? Mr. Hutton, quoting one of the team reports, remarks that, ***"'the greatest obstacles to increased productivity are psychological rather than technical.'*** We have to deal first and foremost with men, not machines." And THE ECONOMIST, pursuing the line of inquiry suggested, reaches the conclusion that, by and large, the people of Britain do not want to prosper by being more efficient. THE ECONOMIST says:

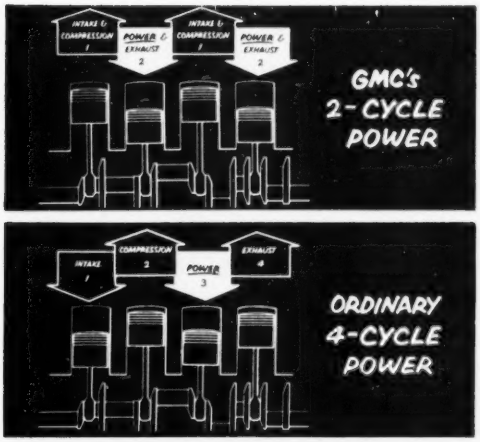
> "The real secret of American productivity is that American society is imbued through and through with the desirability, the rightness, the morality of production. . . . But in Britain, if any moral feeling at all survives about economic matters, it is usually a vague suspicion that economic success is reprehensible and unworthy. From this difference in attitudes everything else follows."

"How," asks THE ECONOMIST, "shall we set about restoring some belief in the rightness of effort, the morality of success?" For this question it has no ready answer. Neither have we. We are confident that the British people will neither be cajoled nor coerced into trying to match our productivity. Basically the problem seems to be to demonstrate clearly to them the truth of the proposition, set down by Graham Hutton, that "there is no goal, aim or end before a Good Society which the raising of that society's material productivity cannot render easier of achievement." Doing that in an old and settled country like Britain is obviously an extremely formidable undertaking. But ***until it is done, the crucial job of getting Britain and the rest of Western Europe firmly on its economic feet will remain to torment all of us.***

McGraw-Hill Publishing Company, Inc.

ROCK-BOTTOM OPERATING COST is the key to GMC Diesel's great popularity for construction work. They squeeze extra mileage from Diesel fuel. Over-all ruggedness means fewer repairs—less down time. These trucks last longer—earn more.

They've Got Plenty Riding on GMC Diesels



EVERY PISTON-STROKE IS A POWER-STROKE! That's the GM principle that gives 2-cycle GMC Diesel haulers the big edge over other trucks—all depending on ordinary 4-cycle power production. GMC's sustained power improves highway time—increases pull. And this trimmer, more compact engine design saves dead weight—increases payload capacity.

EVER wonder why top contractors give the nod to GMC Diesel trucks for the biggest—most important—jobs?

Main reason is their confidence in GMC's *extra-stamina engineering*. That's the extra might built into massive frames. The extra toughness in shock-smothering springs. The generously oversized axles. In fact, it's all-over ruggedness far beyond the needs of any job—in trucks rated up to 63,000 GVW-100,000 GCW.

Power To Spare, Too

These GMC's can not only take it—but dish it out. Even-gaited *2-cycle* Diesel engines pour it on for timesaving highway work. And they rate especially high in what engineers call "torque." That's power that becomes sheer brute force to propel your heftiest loads up steep grades—or through off-the-road muck and mire.

Drivers go for these big GMC's. They get the extra pull with less gearshifting. Airy "Six-Footer" cabs are home-comfort cushioned. And ball-bearing steering makes handling a snap.

Too good to be true? Let your GMC dealer show you the model that will deliver the goods on your next big job. How can you lose?

GMC DIESEL TRUCKS

19,500 GVW to 100,000 GCW

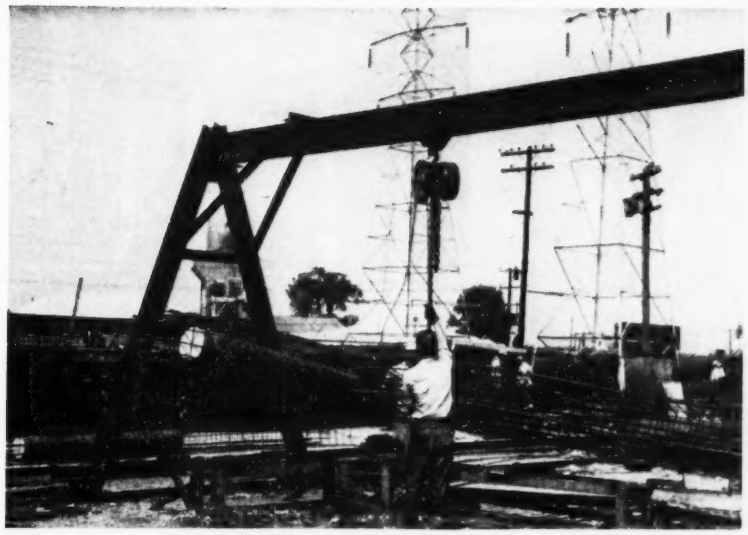
GMC Truck & Coach Division of General Motors

7½ TONS OF CONCRETE swings into place to frame one of three 200x600-ft precast concrete warehouses for Navy at Great Lakes, Ill., being built by Corbetta Construction Co., New York and Chicago. This member is a center drop-in girder that will span between T-heads on column tops. Welder (beyond 35-ton P&H crane's cab) joins caps to columns, will later weld this girder to cap.

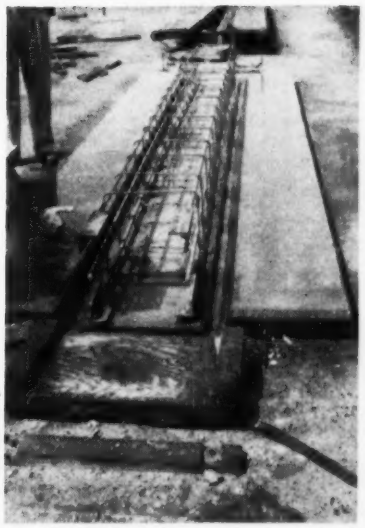
Precast Warehouses Go up Fast... ...And Cheaply

By HENRY T. PEREZ, Senior Associate Editor

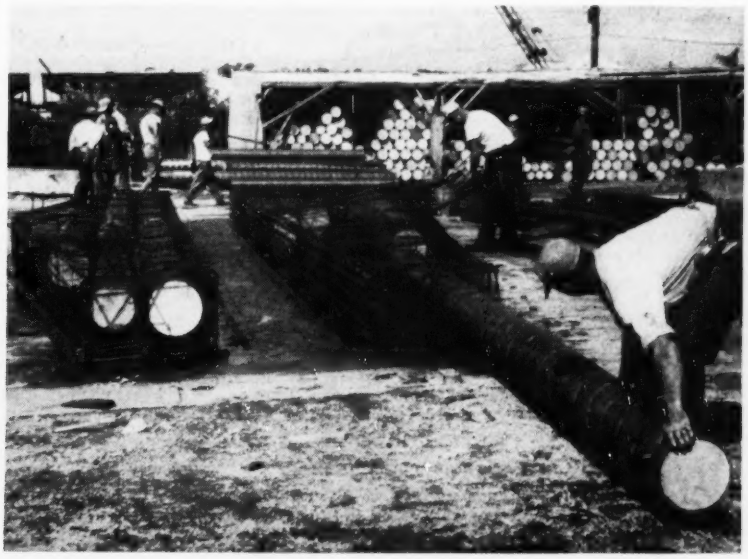
BY PRECASTING just about everything in sight, Corbetta Construction Co. is making short work of building three big concrete warehouses near Chicago. An efficient casting yard turns out 69 components (56 thin-shell wall and roof slabs, and 13 hollow rigid-frame members) in one 8-hr shift. A single erection crew sets the same number in even less time. This means that the equivalent of one entire 22½x200-ft bay, plus loading-platform canopies, is completed daily. Total cost of the



REINFORCING CAGES for all precast concrete members are assembled in yard served by rolling gantry carrying 2-ton Yale chain hoist. This reinforcing cage, in which one of series of cardboard lightening tubes has already been placed, is for L-head column.



HINGED FORMS make precasting easy and exact. Angles welded to re-steel of column will be erection-welded to abutting member.



CARDBOARD TUBES (10-, 12- and 14-in. dia Sonovoids) reduce concrete content of framing members. They let building components, originally designed as hollow-box sections assembled from two precast channel-shaped halves, be precast in one piece to cut costs.

sprinklered warehouses: only $5.85 per sq ft, including mechanical trades.

Corbetta is building three of the precast concrete warehouses for the Navy at Great Lakes, Ill. Each is 200x600 ft, with canopied loading platforms projecting beyond both long sides. Maximum height is 25 ft.

Rigid-frame bents extending the 200-ft width of the building are on 22½-ft centers. There are 28 of them per warehouse, each consisting of two L-head (dog leg) exterior columns, two straight interior columns, two T-head caps atop these, and three drop-in girders. These last span between L- and T-heads, and from T to T. Column spacing is 65-70-65 ft. In alternate bays, four transverse struts brace adjacent bents.

Frame members are hollow—all except the struts containing cardboard tubes (Sonovoids) embedded in the pour. Struts are cast around inflated rubber tubes that are extracted later. These methods of forming voids are improvements, instituted by Corbetta, over original plans that called for members to be cast as channel-shaped halves with inserts that would be welded together to make hollow-box sections. While the new technique results in somewhat heavier members (adding about 3% to total superstructure weight) the cost of casting, handling and erection is far less than for the original.

The rigid-frame bents support precast slabs for walls and roof. Side-wall slabs, placed horizontally, are 22½ ft long to span between bents. End-wall slabs are set vertically and extend full height from floor to roof.

In general, the slabs are ribbed panels 5 ft wide. Edge ribs are 10 in. deep and average 3½ in. in width, while four interior ribs are 8x3½. Slab thickness between ribs is only 1¼ in. Near floor level, however, wall panels are solid 10-in. slabs for additional resistance to impact. Roof slabs are similar to the 5x22½-ft wall panels. Designed for a 40-lb live load, roof slabs weigh only 31 lb per sq ft.

All the foregoing pieces are being precast in one concrete-floored yard adjacent to the three warehouses. Here are set up 13 forms for rigid-frame members (one complete bent) and 56 molds for slabs (one complete bay). That's just one 8-hr shift's production.

One thing that makes for this fast progress is that all reinforcing is prefabricated, ready to be dropped into the forms. Alongside the casting area are a power

(Continued on page 108)

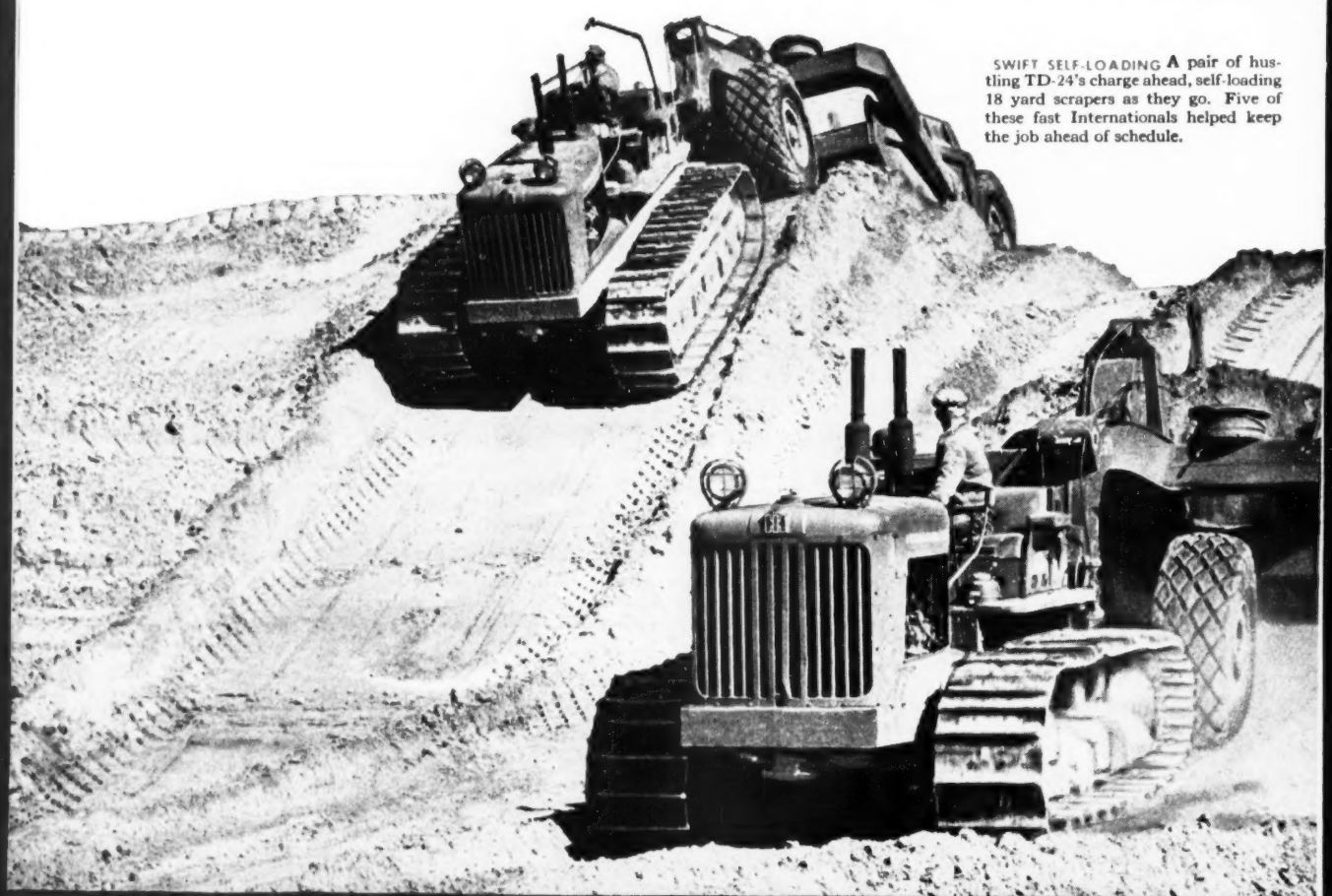
"Big Red"

Contractor completes job 45 days ahead of estimate as TD-24 fleet moves a million yards

Ryan Construction Company, Evansville, Indiana, took on a big job when they contracted to move a million cubic yards of dirt and place 35,000 tons of riprap in site preparation for a new steam generator plant on the Ohio River.

From the first day on the contract, Ryan's five TD-24's made the dirt fly. Their assignment: to cut down two hills and dump the excavated material in old creek bed to make a new power plant site.

They averaged 4 minutes and 40 seconds on the 2,000 foot round trip between cut and fill. Self-loading heaped



SWIFT SELF-LOADING A pair of hustling TD-24's charge ahead, self-loading 18 yard scrapers as they go. Five of these fast Internationals helped keep the job ahead of schedule.

TD 24 Rolls for Ryan

scrapers, the Big Red fleet moved tremendous yardages every day—kept doing it even in rain and mud, the Ryan people report.

TD-24's are the fastest and most powerful crawlers on the market. That's why "Big Red" performance is paying off not only for Ryan but for contractors across the country who need big crawler power to get tough jobs done on time.

And you can't beat the service provided by your nearby International Industrial Distributor. His trained servicemen, complete stocks of parts and up-to-date shop facilities are available to you anywhere, anytime to keep your equipment in production.

He and the famous line of IH crawlers he sells are willing and able to help you put your contract on a paying basis.

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILL.

POWER STEERING WITH FULL LOADS mean faster cycles, higher daily production. Because "Big Red" steers with full power on both tracks, it can maneuver with the same heavy loads that can be pulled on the straightaway.

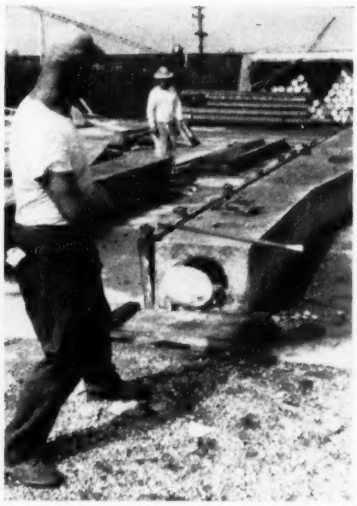
WATCHING BIG RED ROLL Ryan Construction men keep close tabs on the performance of their five TD-24's. Cycles are clocked for half an hour every morning and afternoon. Left to right: Guy Tilley, Job Superintendent, Tom Vickers, Job Foreman, and Virgil Scales, Superintendent.

INTERNATIONAL HARVESTER

INTERNATIONAL

POWER THAT PAYS

TRANSIT-MIX CONCRETE from Rex Motomixer on International L190 truck is chuted directly to forms. Pre-cut wood rakers brace wood forms to inserts in concrete floor of casting yard. Timbers spanning forms are to hold embedded cardboard tubes in position.



WIRE STRIPPERS on cardboard tubes of column sections let bottom part be pulled out for complete bond later with foundation.

VIBRATING SCREED strikes off concrete for wall and roof castings, 56 of which are made in each 8-hr day along with 13 members for complete, braced rigid-frame bent. Castings remain in molds until next day, then are removed to storage for two more days before erection.

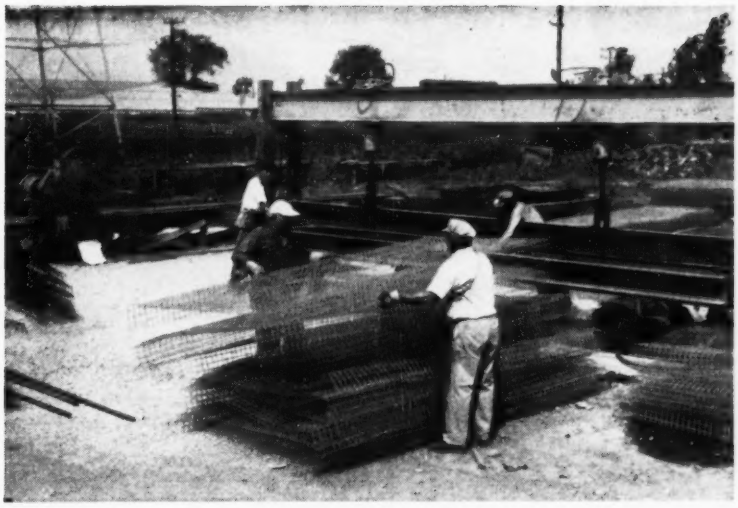
LUMBER CARRIER removes castings from molds, which are immediately cleaned to prepare for next pour. Ross carrier is fitted

shears and hydraulic press that cut and bend galvanized wire mesh. This material goes both into frame members (4x4-in. No. 6 wire) and slabs (2x2-in., No. 12). Here too are tables and jigs where the mesh is wired to additional rods, and where reinforcing cages are made up.

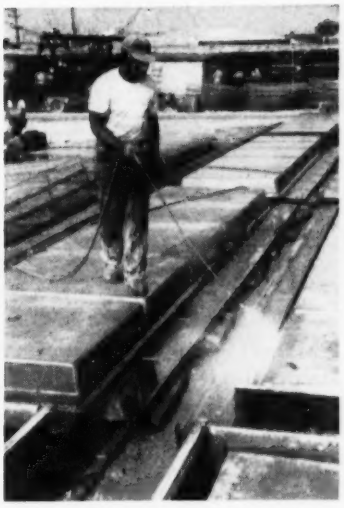
Completely assembled, reinforcing is just dropped into its form. Forms for frame members consist of wood side and end panels, sometimes faced with sheet metal, that are hinged at the bottom to inserts in the concrete base slab. Pre-cut wood braces are raked down to other inserts to wedge the top of the form. Thus, nailing is eliminated, except for wood struts spanning the top to hold fingers that keep the Sonovoids from rising as concrete is poured around them.

Ribbed wall and roof slabs are cast around highly polished concrete reverse molds. Side forms are steel channels hinged to the bed's concrete floor. As with the other forms, these are braced by pre-cut rakers wedged to floor inserts, or are blocked to the adjacent forms. It's expected that all forms will last the life of the job—84 uses.

Concrete is an 8-sack transit-mix (see table) delivered from a local plant. Chuted directly from mixer

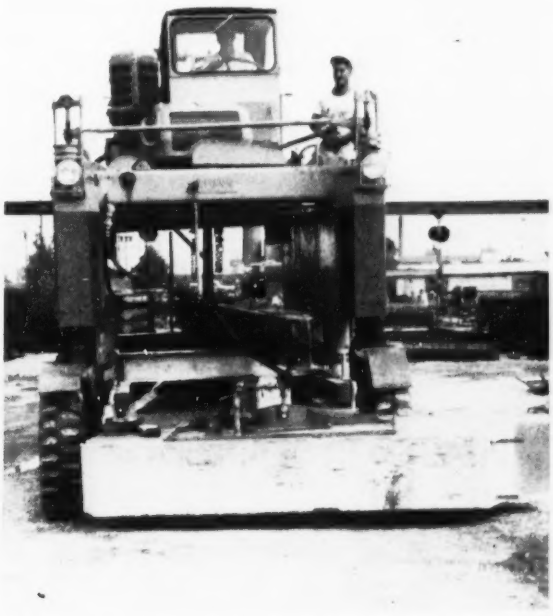


REINFORCING MESH for wall and roof panels is stacked after being cut in power shears (far left) and bent in pneumatic press (center). Rest of reinforcing steel will now be wired on. Prefabbing of all re-steel is one of keys to fast and economical concrete job.



CONCRETE MOLDS AND STEEL FORMS for roof slabs are oiled before pour. Half-rounds make holes for sprinkler hangers.

with its own vacuum pump to operate its three lifting pads. A second Ross carrier, without vacuum lifters, moves four-high stacks of precast slabs from storage yard to erection site in normal fashion.



ADJUSTABLE LIFTING PADS slung from movable beam on straddle truck let unit handle heavy, awkward castings with ease. This L-head column weighs 6 tons; its arms are 10 and 22 ft long.

to forms, it is vibrated, hand or machine screeded, finished and spray cured.

Castings can be removed from the forms or molds after curing 20 hr, at which time the concrete has reached a 1,500-psi strength. All members are stripped and removed to storage (leveled sand beds for frame members, four-high stacks for panels) by a Ross lumber carrier. This straddle truck is fitted with a vacuum pump and three 3x5-ft lifting pads that operate under a vacuum of about 25 in. of mercury. The face of each pad is compartmented into three sections,

(Continued on page 112)

Precast Concrete Members

	Dimensions Ft	Weight Tons	Number per bent	Erection Sequence
L-head column	22x10x1½	6	2	1,5
Interior column	19x1 2/3x1½	2½	2	2,6
T-head	40x5½x1½	12	2	3,7
Side drop-in girder	31x2¾x1½	6½	2	4,8
Center drop-in girder	37¼x3x1½	7½	1	9
Struts	21x1x2/3	¾	4	
Panel slabs	22½x5	1¾	56	

Balanced Design...

ONE REASON WHY BUCYRUS ERIE BLADES CUT ROADBUILDING COSTS

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HOW IT CUTS ROADBUILDING COSTS . . . Better blade control and tractor maneuverability enables operator to produce accurate grading and fine finishing in a minimum of passes — *you save time.* Having the advantage of full tractor power lets you move more dirt on every pass and get the job done faster — *you save money.* Since there is no waste of tractor power, *you save fuel costs.* And lastly, because there's no upset of balance to strain the tractor there's less wear on tractor parts — *you save maintenance costs.*

Investigate these and the many other features offered in Bucyrus-Erie blade attachments. Get the complete story from your International Industrial Tractor Distributor today. 7153

BUCYRUS-ERIE COMPANY, South Milwaukee, Wisconsin

TD-14A and TD-18A Bullgraders and Bulldozers Hydraulic or Cable Controlled

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Special Chassis Available for Any Rigs from 2 Ton to 50 Ton Capacity . . .

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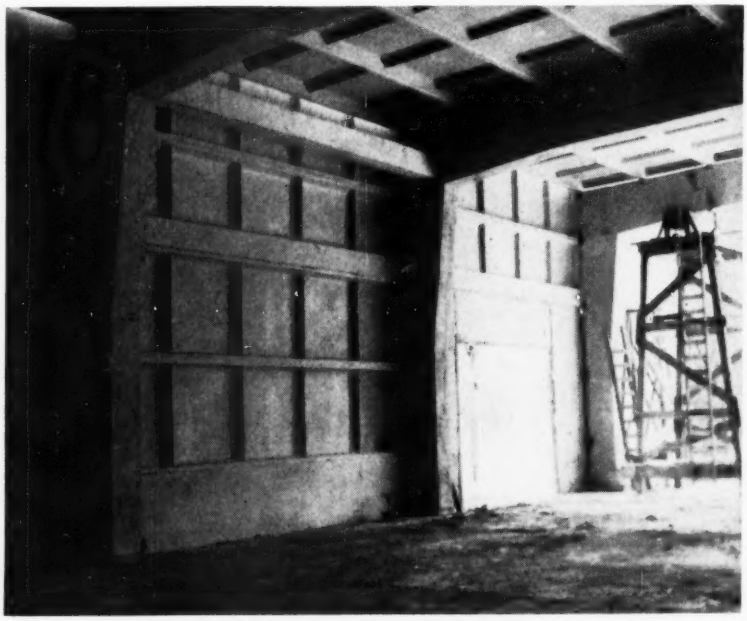
DART TRUCKS — TONNAGE ENGINEERED

Kansas City 8, Missouri

PRECAST FOUNDATIONS TOO are a feature of Corbetta's warehouse job. Cast one atop another, 6x20-ft foundation walls between cast-in-place spread footings taper from 12 in. to 4, will be tied together by cast-in-place pilasters. They support building's precast wall slabs. Warehouse floor, poured after foundation completion, is 6-in. concrete slab on top of 6 in. of porous fill.

Typical Concrete Mix

Cement	756 lb
Sand	1,441 lb
Gravel (½ in.)	1,601 lb
Water	32 gal
Slump	2½-3 in.



HANDSOME WAREHOUSE results from exact precasting techniques. Frames, struts, wall and roof panels all fit together neatly. Non-ribbed panel containing frame for rolling overhead door was precast on warehouse floor, then tilted up into place to limit handling stress.

any of which may be valved off at will for handling narrower members without loss of suction.

The pads themselves are slung from a 20-ft steel beam beneath the straddle truck. Both beam and pads are movable so they can be positioned to best advantage to pick up any of the castings easily, even the extremely unsymmetrical L-head columns.

Castings remain in storage two days for further curing to attain a strength of 4,000 psi. Then Ross carriers deliver them to within reach of a 35-ton P&H truck crane for erection.

An accompanying table includes the erection sequence for a rigid-frame bent. Timber falsework towers support the L- and T-heads; interior columns are braced with inclined shores. When drop-in girders have been placed and suspended between column heads, projecting reinforcing rods are welded to those extending from the heads. Then the space between members is grouted. Also, inserts in interior columns and T-heads are welded together and dry-packed. Meanwhile, foundation reinforcing extending up into the bottom of the hollow columns is concreted in. Thus the entire bent is rigidly tied together.

The same erecting crane sets wall and roof slabs while the frame is being completed. Walls tying this frame to the next one back are erected first, followed by roof slabs in the preceding bay. This step-back procedure gives the frame's concreted joints a full day to cure before roof-slab load is applied on one side, two days before it is applied on the other side, and three days before the falsework towers are moved out and ahead. Both wall and roof panels are

WELDED REINFORCING RODS tie rigid-frame members together after erection by crane. Entire joint will be grouted in later. Timber falsework with built-in screw-jacks holds members temporarily.

CONCRETE JOINT is poured and vibrated inside hollow column base to encase foundation reinforcing steel extending into it. Welded inserts, later dry packed, join column top to its cap.

END WALL PANEL is hoisted into place, where welded inserts will hold it. Side-wall panels go up horizontally, spanning from bent to bent. First bay of roof panels is already in place as bracing.

fastened to the frame by welding together matched steel plates previously welded to reinforcing rods in each piece.

The resulting warehouses are handsome, functional and economical—a credit both to the Navy and Corbetta Construction Co. Plans for them were drawn by the 9th Naval District's Department of Public Works, based on Yards & Docks standards prepared by Arsham Amirikian, chief designer. Capt. Henry C. Shaid is 9th N. D. public works officer, L. J. Arthur is structural-branch manager, and Lt. Cdr. E. C. McBurney is resident officer in charge of the job.

Corbetta's warehouse project is under the direction of Louis J. Corbetta. Mario Egidi is project manager, William Hendricksen is office engineer, Albert Olsen is general superintendent, and Oscar Henriksen and Joseph Donnino are, respectively, superintendents of casting and erection.

MARION Rock bodies stand up Under a shovel!

It takes a tough body to stand daily shovel loading. That's why more operators are putting Marion's into service. On-the-job experience has shown that Marion bodies are built to withstand the severe beating and hard knocks of heavy off-the-road haulage service.

Marion engineers have combined the finest materials available with modern advanced design... to produce the most efficient, trouble-free heavy dumping units on the market. And Marion's built-in durability means consistent performance . . . longer life, and lower upkeep.

A Marion body and hoist makes a good truck — *better!* Your nearby Marion Distributor can give you all the facts—or write direct today.

"Designed on the Job"

MARION BODIES AND HOISTS

MARION METAL PRODUCTS CO.
Marion, Ohio, U. S. A.

A complete line of standard and special Hydraulic Hoists and Dump Bodies for heavy-duty service

"Save money? Sure!"

THAT, in a nutshell, tells you why so many wire rope users in excavating and construction prefer Roebling wire rope ...it speeds up operations...lasts longer on the job... saves money that really adds up.

For the last word in wire rope efficiency and economy, call your nearest Roebling office or distributor for a Roebling recommendation.

ROEBLING
A subsidiary of The Colorado Fuel and Iron Corporation

JOHN A. ROEBLING'S SONS CORPORATION, TRENTON 2, N. J. BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, TRENTON 2, N. J.

OPERATOR SITS HIGH above rear-mounted engine on new Baker-Lull Shoveloader. Big 1½-yd bucket extends beyond front wheels, clearing path for travel. Note main 7-in. hydraulic hoist in center that lifts bucket. Linkage automatically holds load level, but bucket on other front-end attachments can be tipped by auxiliary hydraulic hoists.

Baker-Lull Launches Rugged Front-End Loader

Another Equipment Development Report

By HAROLD W. RICHARDSON, Editor

ANOTHER NEW, but outstanding, addition to the crowded front-end loader field is the Baker-Lull Shoveloader, a big husky 4-wheel drive rig rated at 1½-cu yd bucket capacity and 6,000-lb lift. It's not only new, it's entirely different. The operator sits way up on top where he has a full view of everything. He's got plenty of power to apply to all four wheels, and he's got five speeds forward and reverse at his command for fast travel in either direction. And the buyer has a choice of four-wheel steer for short turning radius, or steering applied to front or rear wheels only, with a longer turning radius.

Baker-Lull, of Minneapolis, are no strangers to the loader business, but they've been working on this new unit a couple of years now. They went through the customary procedure of building prototypes for testing, and of course, made some changes as they went along. Axles seemed to be a weak point—too much power for them.

A suitable axle could not be found anywhere on the market that could withstand the terrific strain and stress to which a loader of this type is subjected. Truck axles, of course, were not heavy enough for a heavy-duty rig such as this Baker-Lull unit, as they are subject to breakage. Baker-Lull had to design their own axles with a 3:1 planetary gear reduction in each wheel. This reduction lessened the strain on axle shafts, the differential and the entire drive train by approximately 300%. We predict there will be no axle trouble from now on with this particular unit.

Let's take an over-all look at this big rig—and she is big enough to take it out of the class of run-of-mill loaders. It's rated at 1½-cu yd capacity, with a working lift of 6,000 lb and a peak lift of 9,000 lb.

Tires are high-flotation type, 14.00x20 all around, for easy travel through sticky ground. The rear axle oscillates 23 in. about the longitudinal axis, which means maximum ground pressure on all four tires over rough terrain. This feature, coupled with 4-wheel

(Continued on page 120)

IT'LL PAY YOU TO INVESTIGATE THE

NEW **Bantam Crawler**

. . . at the lowest price in the Industry

$9,350

F.O.B. Factory - Basic Crawler with 1400 Lb. Counterweight, less attachment (Price subject to change.)

CAN YOU AFFORD NOT TO OWN A C-35?

Get a "$'s and Sense" On-YOUR-Job Demonstration today!

ask your Bantam Distributor or write factory now!

Only Bantam gives you these Design Features at $9,350

TWO-SPEED INDEPENDENT TRAVEL ENABLES the operator to move at varying speeds, forward or backward, while operating the front end attachment.

LOW GROUND-BEARING PRESSURE - 2 pad sizes available - 5 lbs. per sq. in. with 16" pads - 3-⅓ lbs. per sq. in. with 24" pads.

BIG MACHINE STABILITY - Longer, wider tracks - and a low center of gravity gives greater lifting capacity.

HIGH SPEED OPERATION features immediate acting straight mechanical controls, easy positive breaking action, fast line and swing speeds.

FAMOUS BANTAM FEATURES - Power boom hoist, machine cut gears, anti-friction bearings, 4 hook rollers, greater visibility.

94-INCH OVER-ALL WIDTH allows the Bantam to be moved from job to job on standard trailers without special highway permits.

9 fast-change attachments available for the C-35 . . .

BACK HOE
CRANE
DRAGLINE
MAGNET
PILE DRIVER
GRAPPLE
BACKFILLER
SHOVEL
CLAMSHELL

5 TON
⅜ Cu. Yd.
MODEL
C-35

Write for FREE
C-35
SPECIFICATIONS
BOOKLET Form
C-100

SCHIELD **Bantam**

COMPANY • 221 PARK ST., WAVERLY, IOWA, U.S.A.

SB-CBH-3

ANOTHER NEW PRODUCT OF THE WORLD'S LARGEST PRODUCER OF TRUCK CRANES AND EXCAVATORS

BACK HOE - Crawler working in heavy mud crawls out after trenching with no trouble. C-35's flotation enables Bantam to work in all kinds of weather under rugged underfoot conditions of muck, mud and sand.

SHOVEL - Handles up to 100 cu. yds. per hour from stockpile . . . up to 90 cu. yds. excavating in average material. Automatic dipper trip means quick, effortless dumping. Also available with ½ cu. yd. rehandling bucket.

DRAGLINE - Digs 90 cu. yds. per hour in average material. Available with perforated or solid buckets. Ideal for gravel pits, ditch cleanout, cutting new drainage ditches, basement excavations, stockpiling, pits, etc.

CLAMSHELL - Ideal for material handling and loading out of stock-pile . . . precision excavating of bell holes, special excavating on pipeline jobs, clean-out of trenches. Handles up to 80 cu. yds. of average bulk material per hour.

MAKE YOUR LOWEST BID MORE

BIG VOLUME PLUS LOW MAINTENANCE *CUTS COSTS PER TON*

To bid low, *and make a profit,* you need the best and most efficient equipment you can get . . . not the cheapest machines, but the ones which produce the most tons per hour at the lowest cost per ton.

Buy the best equipment on the market, and write off your investment by making more profit on every ton produced. For instance . . . when you can get up to 80 tons per hour *more* from your Cedarapids Commander plant than generally accepted aggregate production of equipment of comparable size . . . and if you get, say, $1.00 a ton on the market . . . then the profit on that *extra* $80 an hour is gravy, because with Cedarapids big-volume output, *there's no increase in maintenance or operating costs!*

You can bank on the bonus production of Cedarapids Plants that lets you bid low . . . and make money.

Your Cedarapids distributor will gladly help you choose the plant which will give you the best production, performance and profit on your particular job. Call him today.

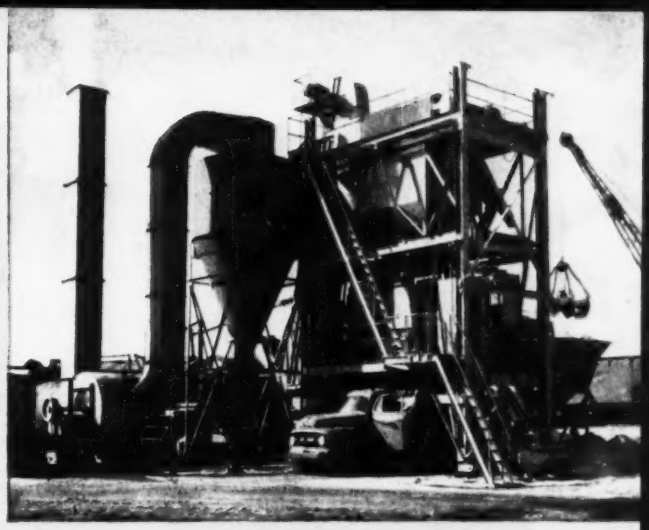
160 TONS PER HOUR of 1" material and 25% to be crushed with the Cedarapids Junior Tandem. This highly portable plant has the versatility to handle a wide range of gravel crushing and screening operations at low cost.
600 TONS PER HOUR! That was average production of the Cedarapids Model 5360S Double Impeller Impact Breaker on a New Jersey job, with a peak hourly production of 734 tons! Six sizes of Double Impeller Impact Breakers are available to produce cubical shaped aggregate in any volume you need.

THE IOWA LINE *of Material Handling Equipment Includes:* ROCK AND GRAVEL CRUSHERS • BELT CONVEYORS • STEEL BINS • VIBRATOR AND REVOLVING SCREENS • UNITIZED ROCK AND GRAVEL PLANTS • FEEDERS • PORTABLE POWER CONVEYORS • PORTABLE AND STATIONARY STONE, GRAVEL AND SAND PLANTS • REDUCTION CRUSHERS • BATCH TYPE AND VOLUMETRIC TYPE ASPHALT PLANTS • DRIERS • DUST COLLECTORS HAMMERMILLS • WASHING PLANTS • VIBRATING SOIL COMPACTION UNITS • DOUBLE IMPELLER IMPACT BREAKERS

PROFITABLE

WITH

CEDARAPIDS EQUIPMENT



MORE PROFIT ON EVERY ASPHALTIC CONCRETE JOB

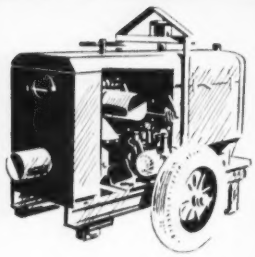
Up to two tons at a batch, plus low maintenance and operating costs, assure profitable operations on the biggest jobs when you use the Cedarapids 4000-lb. Model E Bituminous Batch Type Mixing Plants. Cedarapids Continuous Type plants with single and twin shaft pug mills meet the most rigid specifications. For smaller jobs, there's a size and type of Cedarapids bituminous mixing plant, Batch or Continuous Type, to meet every requirement. Ask your Cedarapids distributor for details.

250 TONS PER HOUR of 1" material and 25% to be crushed and more, with lower crushing percentages! That's the report about Cedarapids Commander Plants from all over the country. The Commander is designed for producers who need greater output of fine crushed products, or where pit conditions put a bigger load on the secondary crusher.
200 TONS PER HOUR of 1" material and 20% to be crushed is the conservatively rated capacity of the Cedarapids Super Tandem under average conditions. The high screening capacity of this unit fills the need for a plant which can process material with high percentages of fines or excessive amounts of soil, sand, clay or semi-wet material.
300 TONS PER HOUR of 1" material and 20% to be crushed for the Cedarapids Master Tandem, the largest, self-contained one-piece portable plant in the Iowa line. This big unit is ideal for your biggest jobs . . . and "Masters" them all.

IOWA MANUFACTURING COMPANY

Cedar Rapids, Iowa, U.S.A.

THIS DIESEL
WELLPOINT PUMP
RUNS MORE HOURS
ON LESS FUEL
(it's a "Complete", of course)



Who else but "Complete" could create a wellpoint pump that is such a giant in capacity (up to 1200 gpm) and such a miser on fuel. Who else but "Complete" equips this 6" suction and discharge unit with this amazingly economical diesel engine! Who but "Complete" would engineer the "Little Giant" Wellpoint Pump with everything needed for long, successful operation—beginning with special vacuum pump priming from an air separation chamber! Who but "Complete" could make it so easy for you to get this pump —*when* you want it—on a *sell* or *rent* basis! Want highest efficiency? Want great capacity? Want fuel economy? Then you want this "Complete" Little Giant Wellpoint Pump. Get the facts. Write today.

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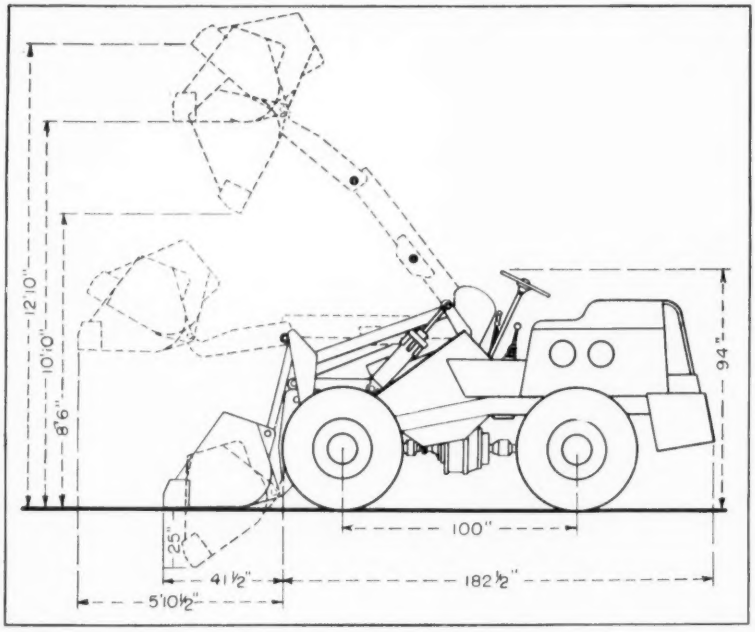
COMPLETE MACHINERY & EQUIPMENT COMPANY, INC.
36-40 11TH STREET
LONG ISLAND CITY, N. Y.

•

COMPLETE
WELLPOINT SYSTEMS

BAKER-LULL LOADER . . . Continued from page 116

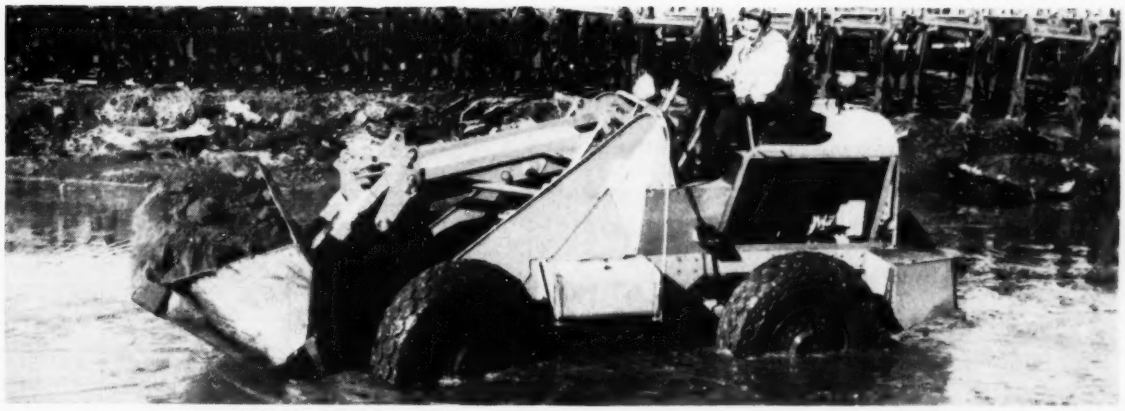
POWERFUL 4-WHEEL DRIVE pushes loader into bank or up steep grade, as shown here. Engine and 2,000-lb counterweight at rear balance 6,000-lb load over 100-in. wheelbase. Steering arrangement is optional: 4-wheel steer allows 7½-ft rad. turn; front or rear 2-wheel steer permits 23-ft rad. turn.



WORKING DIMENSIONS are indicated by this diagram. Down crowd puts bucket 25 in. below wheels.

drive, enables the machine to travel just about anywhere under full power. A shuttle gear transmission permits quick change of direction travel with five speeds in either direction. Then, too, you have power steering throughout, on both the 4-wheel steer or front- or rear-wheel steer arrangement. With a wheelbase of 100 in., and a wheel tread width of 74 in., the loader is certainly stable under all load conditions.

The operator sits up high, above the engine, and clear of all linkage and other movable parts. He has full view of the bucket or other front-end attachments. Controls are within easy reach. Besides the standard 1½-yd bucket, the front



HIGH CENTER CLEARANCE and big low-pressure tires allow loader to work in wet and swampy conditions. High engine mounting keeps power unit up in the dry.

end may be equipped with a 2½-yd snow or coal bucket, lift forks, or a straight bulldozer blade. Front-end attachments work on a parallelogram, which keeps the load level at all times unless deliberately tipped by the operator.

The machine is powered either by a Hercules 77-hp diesel or a 93-hp gas engine. Power is transmitted from engine to axles through a metallic-faced 15-in. clutch and conventional transmission. A Baker-Lull transfer case houses the shuttle gear mechanism, and, in turn, is driven by a standard 5-speed transmission. To eliminate axle breakage, they designed their own axles with a 3 to 1 gear ratio in each wheel.

Gear-type hydraulic pumps operate the loader mechanism at 1,200 psi. The hydraulic system includes a single 7-in. main hoist cylinder and two smaller cylinders for bucket control. Automatic crowding action is provided by the fixed linkage arrangement. Yet, the operator can manipulate the hoist and tilting operations independently, if desired. And, if he wants to dig a little, he can excavate to a depth of 25 in. below wheel level with a power downcrowd.

Shoveloader Specifications on page 123

Parmanco

Latest in design . . . HI-SPEED

HORIZONTAL DRILL

Drills a 6-inch hole in two-thirds the ordinary time

Completely re-designed around a 40 h.p. engine

NOTE: Auger rack a Parmanco feature which saves on drilling time. Augers always handy on machine as it is moved from hole to hole. Four individually adjustable leveling jacks for faster set up and smoother drilling.

The HI-SPEED DRILL is designed for drilling 5-6-8 inch holes to 100 feet or more. The 40 h.p. engine with four drilling speeds makes possible the reduction of footage time by one third. This new drill, the very latest in design, is equipped with self-starter and generator, dual type front wheels, truck type rear axle with hydraulic brakes and traction drive with both forward and reverse. Here is greater speed in retrieving augers and four rotating speeds and reverse for drilling and cleaning the hole. Here is accuracy and mobility. Here is the modern answer to faster, lower-cost drilling. *Send for Complete Details.*

PARIS MANUFACTURING CO. PARIS, ILLINOIS

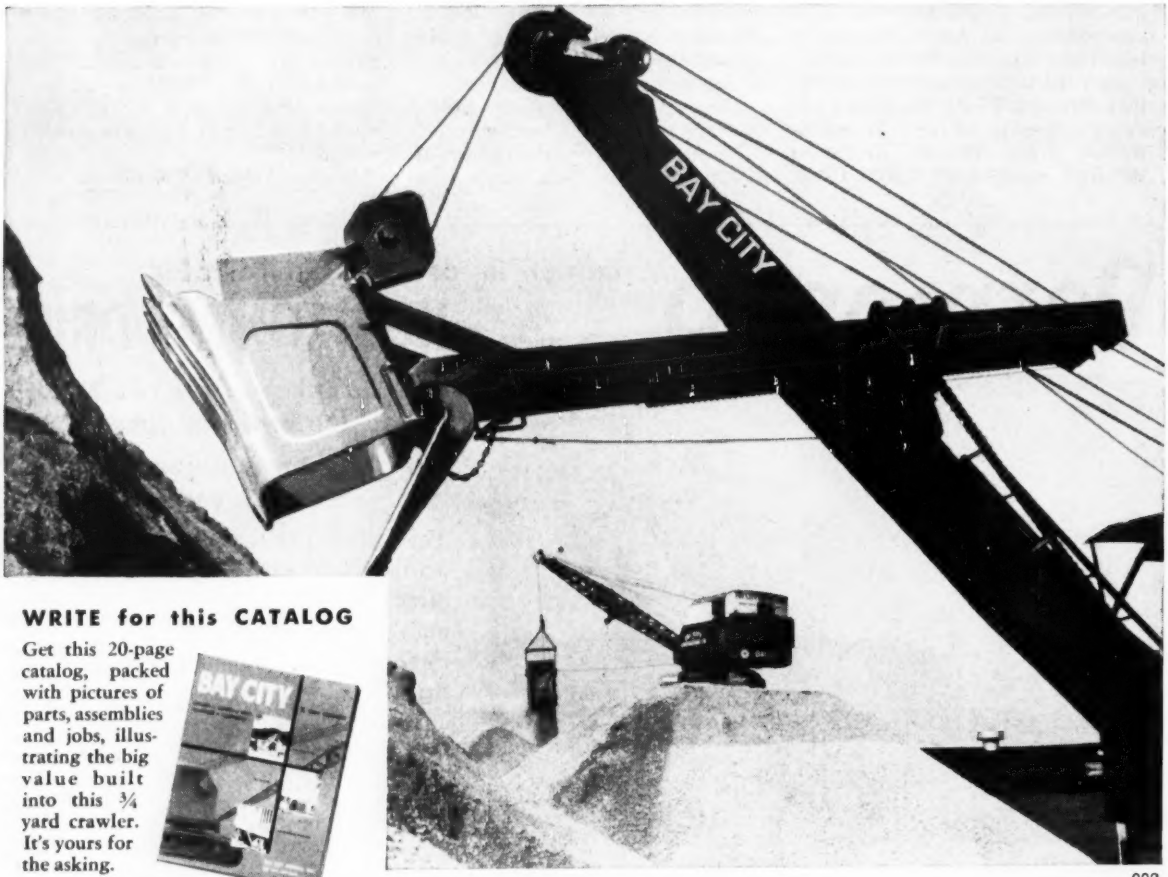
How does your shovel compare with a BAY CITY?

Make a comparison *NOW* of the brief, essential specifications listed here and prove to yourself why dollar for dollar the BAY CITY heavy-duty ¾ yard Model 45 is today's biggest value in excavating and material handling equipment. This is only part of the story — consider the design features for full convertibility — keep in mind the operating advantages that assure snappy swing, quick control, easy operation, and fine balance.

For the full story call your BAY CITY dealer today.

BAY CITY SHOVELS, INC. • Bay City, Michigan

SPECIFICATION	BAY CITY Model 45	Other ¾ Yd. Shovels
Weight (as shovel)	46,500 lbs.	
Power (std. gas)	81 HP @ 1200 RPM	
Engine Displacement	517 cu. in.	
Shovel Boom	19′ 0″	
Crowd	One Piece Chain	
Digging Radius 45°	28′ 1″	
Crane Boom (Std.)	35′ Pin-connected	
Crane Capacity, 10′ Rad.	28,500 lbs.	
Hoe Boom	20′ 0″	
Digging Depth	19′ 6″	
Bases	Cast Alloy Steel	
Crawler Bearing Area	24″ Shoes—5930	



WRITE for this CATALOG

Get this 20-page catalog, packed with pictures of parts, assemblies and jobs, illustrating the big value built into this ¾ yard crawler. It's yours for the asking.

222

BAY CITY

SHOVELS • CRANES • HOES • DRAGLINES • CLAMSHELLS

Specifications of New Baker-Lull Shoveloader

Story begins on page 116

LOADER

Working Capacity	6,000 lb
Peak Lift Cap.	9,000 lb
Speed of Lift	8 sec
Dumping Speed	1.5 sec
Lowering Speed	5 sec
Hydr. System Working Pressure	1,200 psi
Max. Lift Height	10 ft 10 in.
Max. Dump Height	8 ft 6 in.
Max. Reach (ahead of tractor)	5 ft 10½ in.
Down-crowd	25 in.
Ballast Box Cap.	2,000 lb

TRACTOR

Turning Radius (Inside)	
4-wheel steer	7 ft 6 in.
2-wheel steer	23 ft
Rear Axle Oscillation	34 deg
Drive	4-wheel
Total Gear Reduction	
First Gear	108
Fifth Gear	13.5
Tractor Speeds: (according to engine)	1.7 to 20.1 mph

OVER-ALL DIMENSIONS

Wheelbase	100 in.
Wheel Tread	74 in.
Height (Without Cab)	94 in.
Width	91 in.
Length	
Tractor Only	182½ in.
Tractor with 1½ cu yd bucket	224 in.
Tractor with 48-in. forks	242 in.
Ground Clearance (Under Axles)	15 in.

TIRES

Size	14:00x20
Ply	12 ply
Tread Type	Traction
Recommended Air Pressure	30 lb

ACCESSORIES:

Material Bucket	
Capacity	1½ cu yd
Width	92 in.
Coal and Snow Bucket	
Capacity Back Tilt	2½ cu yd
Width	97 in.
Bucket Tilt	
Max. Back Tilt	43 deg
Max. Dump Tilt	58 deg

LIFTING FORKS

(Standard, Adjustable)	
Length	48 in.
Min. Adjustable Distance Between Tines	12 in.
Max. Adjustable Distance Between Tines	72 in.
Fork Tilt	
Max. Back Tilt	37 deg
Max. Forward Tilt	39 deg

BULLDOZER

Height	26½ in.
Width	92 in.

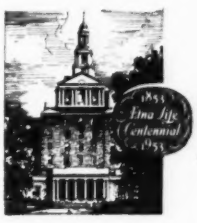
The Sky's the Limit!

This year, Manhattan is celebrating its 300th anniversary. No one has had a greater share in its development than the contractor, whose constantly improved building techniques have made possible this great concentration of industry, commerce, and cultural activities on a 22-square mile island.

Over the years, the Ætna Casualty and Surety Company has handled contract bonds for many of the great contracting firms which helped to mold the Manhattan skyline. Some of these firms, which today are Titans in the contracting field, have been Ætna clients from their earliest and smallest beginnings.

Thousands of contractors know from experience that the Ætna name on the bond is respected, that Ætna's helpful facilities are unmatched, that its financial strength is unquestioned. That is why so many contractors bond with Ætna — always.

"No Job too Big- No Job too Small"



ÆTNA CASUALTY AND SURETY COMPANY

AFFILIATED COMPANIES: ÆTNA LIFE INSURANCE COMPANY

AUTOMOBILE INSURANCE COMPANY • STANDARD FIRE INSURANCE COMPANY

HARTFORD 15 ÆTNA CONNECTICUT

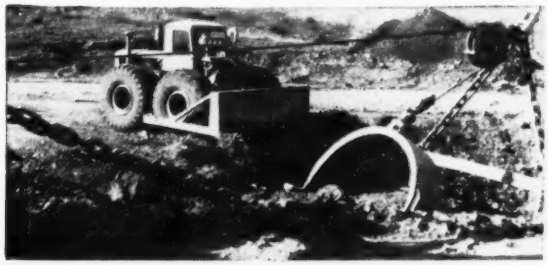
(Advertisement)

Pictures of the month . . . *by LeTourneau-Westinghouse*

DRIVES THROUGH RIVER — In Colombia, Tournarocker brings gravel and sand from river-bed to the new public stadium being built in the city of Medellin. River bottom is rough and full of rocks and holes. Water depths range from 20 to 30 inches, but Tournarocker disc-type air brakes and electric control system have not been harmed, or even affected, in a year of this work. Underwater loading was necessary because the river-bed was the only nearby source of material for concrete.

(Advertisement)

. . . with performance reports from around the world



WORKS IN ABRASIVE MATERIAL —Westmoreland Manganese Corp, Batesville, Arkansas, works their Tournatractor in material so abrasive that dragline teeth must be replaced every 8 hrs. This set of tires, retreaded once, still has 45% of tread left after over 1000 hrs of use. Unit cleans clay and flint rock from around 2½-yd shovel and 5-yd dragline.

PLOWS SNOW AT HIGH SPEED — In addition to moving dirt, D Tournapull can be equipped with a V-Plow and rented out in winter for clearing snow. The machine shown here was used all last winter by Crawford County, Iowa. With a top speed of 28 mph it makes an ideal plow for fast cleanup on farm-to-market and access roads.

25 TRIPS ON 1050 FT CYCLE — On Indianapolis grading job, D Tournapull self-loads 4½ pay yards of scarified dirt and gravel in 35 seconds. Complete 1050 ft cycle takes about 2 minutes. In a 50-min hour, unit moves 25 loads. "An excellent volume of work," says Owner Robert Horth. "The 7-yd 'D' is a very versatile, very handy tool."

153 YDS OF MUD HOURLY — "At the time this picture was taken," writes R. M. Enebak, Faribault, Minnesota contractor, "we were working a series of balances on our 8.4-mile, 442,000-yd road grading job between Faribault and Morristown. The dirt was a very heavy clay, well soaked by 22 days of rain. The going was extremely tough. We used our 3 C Tournapulls with 2 push-tractors on this stretch and our records show an average production for each haul unit of 153 yards per hour. Haul was 400 ft one-way. We are very well satisfied with Tournapull performance. We like their ability to operate in tight places on short hauls, and their speed on long hauls. We also like the fact that moving from job to job is no problem."

(Continued on next page)

(Advertisement)

Pictures of the month . . . by LeTourneau-Westinghouse

STRIPS 200 FT OF SHALE to reach 30 ft seam of coal. This open-pit provides the country of Malaya with its only source of coal. The miners are working 18 LeTourneau haulers 21 hours a day, 7 days a week. Each hauls 18 tons of overburden per load. They averaged 15 mph over narrow, hilly, winding haul roads. Units on one-mile cycles deliver 9 to 10 loads per 50-minute hour.

"GENERAL HANDYMAN" — That's how Jones & Hezlep, Denver, Colorado, describe the D Tournapull they use for sewer clean-up and other city jobs. Here, the 7-yd. "D" helps on trench excavation . . . makes a 300-ft cycle every minute. Unit also hauls excess dirt away from trenches, backfills, builds roads, alleys. Drive tires, recapped after 3 seasons (5000 hrs), are expected to last at least one more season before needing replacement.

GOES ANYWHERE — For moving over mud and lifting out of tight quarters, Tournacrane prime-mover can be turned at right angles to crane for extra stability and greater reach. Big tires and constant-pull differential keep unit rolling through muck. Tournacrane here is lifting wall sections for a new church.

THRU BY '54 — With completion of the 430-mile New York Thruway slated for Sept, 1954, contractors are using fastest methods possible to meet contract dates. On their section south of Rochester, Arute Bros, New Britain, Conn, find this 19 mph Tournatractor ideal for high-speed shaping of roadbed and other dozing jobs.

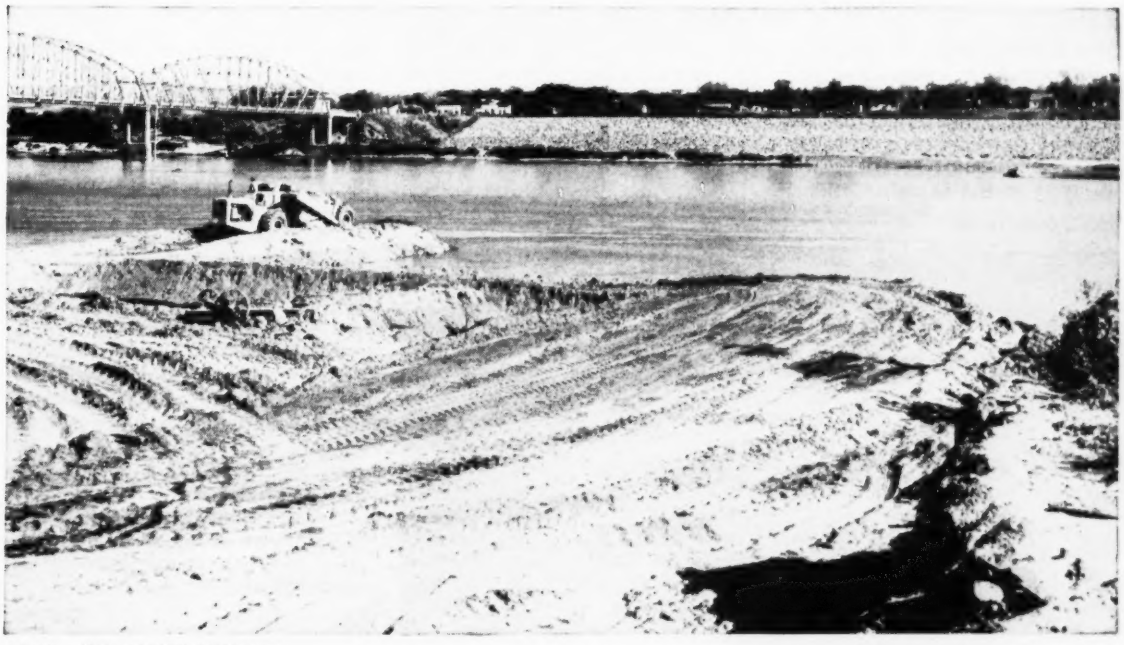
(Advertisement)

. . . with performance reports from around the world

2.2-MILE CYCLE IN 14 MIN — Open top and wide bowl make dragline loading of these C Tournapulls easy. Units also move scraper dirt . . . 4 loads, 48 pay yds, hourly per machine on 2.2-mile cycles. Job consisted of grading a power plant site near Danville, Illinois, by R. A. Cullinan and Son of Tremont.

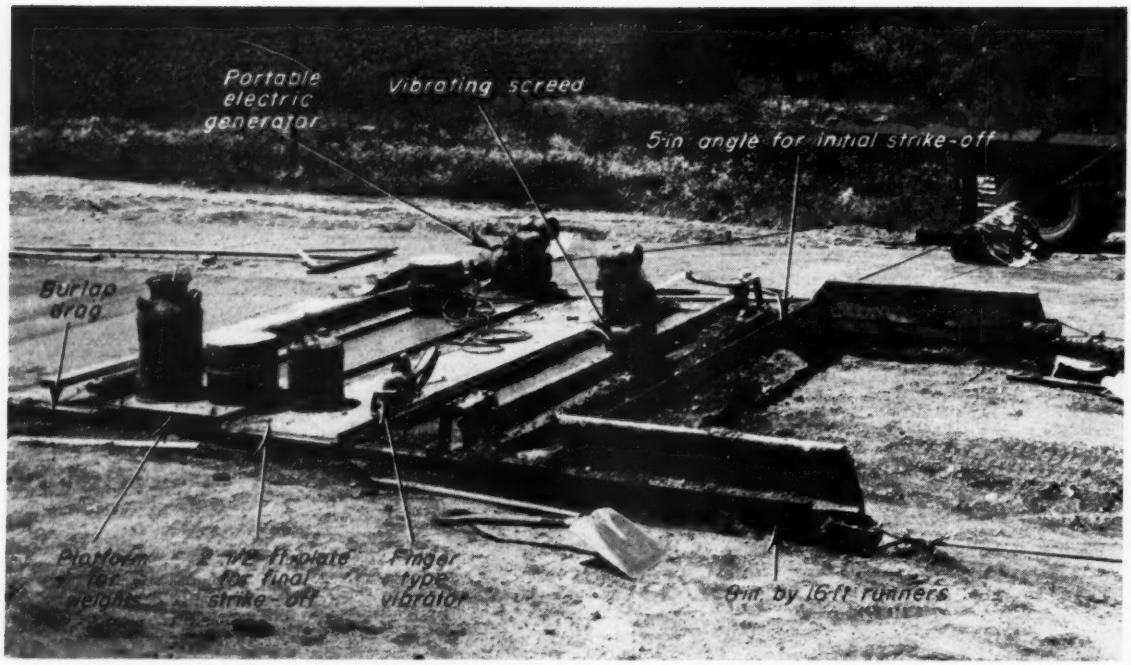
STUMPS, LEVELS, PLOWS — Gene Dyer, West Palm Beach (Fla) rancher, stumps, clears, levels, plows 4,500 of his 27,000 acres annually. His Tournatractor does all of it . . . also builds dikes, ditches, and 8 to 10 miles of new road per year. Says Dyer, "Tournatractor gets around 3 times as fast as the 91 hp crawler-tractor it replaced." It rips out 60 cut-over pine stumps hourly.

DOES WORK OF 2 CRAWLERS — A large Canadian cement company replaced two 148 hp track-type tractors with a Tournatractor on coal stockpiling in Ontario. 19 mph Tournatractor moves as much coal on 900-ft cycles as both crawlers combined . . . still has 10 to 15% of its time available for such "bonus jobs" as building, maintaining roads, removing snow, cleaning pit.



NO JACKKNIFING — Power steer through geared king-pin holds prime-mover and scraper in fixed position as C Tournapull backs easily onto soft fill at end of 7600-ft haul. Unit is one of a fleet used by J. H. Beckman Construction Company, Sioux Falls, South Dakota, to move 200,000 yds for construction of coffer dams and 2 earthfill ramps for parallel bridges across the Missouri River at Chamberlain. Work was made necessary by completion of Fort Randall Dam which will raise the water level 40 ft. Bridge in background will be moved 600 ft to the ramps to carry west-bound traffic. A second bridge is to be moved in to handle east-bound traffic.

Tournapull, Tournarocker, Tournacrane—Trademark Reg. U.S. Pat. Off., Tournatractor—Trademark Pic-492-G



WHEN GENERAL PAVING CO. of Champaign, Ill., had difficulty obtaining a formless paving machine, they designed and constructed this one. It took ten men to operate it, but they were able to process approximately 100 cu yd per hr. Photos Courtesy State of Illinois

Contractor's Formless Paver Shows Promise

By H. JAMES SPELMAN, JR., Engineer, General Paving Company

A MORE ECONOMICAL WAY to lay concrete base course was the objective of the General Paving Co., of Champaign, Ill., so we designed and constructed a "formless paver" machine, the first machine of its type in the State of Illinois that turned ready-mixed concrete into a finished highway without the use of costly forms. Ten men operated the machine that could process approximately 100 cu yd per hr.

Last year, the Illinois State Highway Department, after hearing of experimental work done by J. W. Johnson, Chief of the Central Testing Laboratories of the Iowa Highway Commission, asked the General Paving Co. to construct a 1,000-ft long, 22-ft wide, 9-in. non-reinforced concrete base course without the use of forms, as part of their contract on U.S. Route 51. The 1,000 ft represented a grade change that would be covered by a bituminous surface immediately upon completion.

HERE IS A GOOD EXAMPLE of the edge possible with this homemade machine. At this point no dirt was placed against edge. The dark streaks are the curing compound. The reinforcing bars are the ties between the two lanes.

The machine developed by Mr. Johnson, the rights to which have been sold to the Blaw-Knox Co., (CM&E, June 1950, p. 86) was not available; hence our decision to build our own.

The paver has two 8-in. channels, 16 ft long to serve as runners and movable forms. Connected to these runners by bolt construction is (1) a 5-in. angle to give the concrete the initial strike-off; (2) a vibrating screed actuated by a gasoline motor to impart the necessary vibrations to the concrete; (3) a 2½-ft plate, or "mule," that serves to give the concrete the final strike-

CATERPILLAR D 4 TRACTOR seen in the background was winch equipped and supplied the power to move the rig. When it was found the single winch operated too fast to give a good surface, a series of pulleys was installed to reduce the speed.

off; (4) two platforms for the addition of weight as may be required. As a final strike-off of the pavement there is a burlap drag to give the concrete the appearance required by the State of Illinois. The machine, on this job, was propelled by a V-type cable connected to a Hyster D 4 winch, attached to a Caterpillar D 4 tractor.

The "formless paver" was guided by a 6-in. offset string line for the first lane, and in paving the second lane, the previously placed lane served to indicate the alignment.

Some of the problems that we had to iron out were: During the initial design of the machine, it was our intention to pave two separate 10-ft 10-in. pavements with a 4-in. strip in the center that would later be filled with concrete. However, it was felt that this would be undesirable as well as expensive. We finally decided that when paving the second lane an angle that could slide along the edge of the first pavement would be used as the runner. This, of course, necessitated bolted construction. During paving operations we found that the single winch operated too fast to give a completely desirable surface. To overcome this, we inserted a series of pulleys to reduce the speed to approximately 7 ft per min which proved to be the most desirable rate of operation. It was also found that not enough vibration was imparted to the concrete by the vibrating screed and two additional finger-type vibrators were used.

The runners were lengthened an additional 1½ ft which allowed the finisher more time to touch up the rough spots, and to permit the two laborers to throw dirt against the edges of the finished concrete.

The State of Illinois ran a series of tests during the operation of this machine. The slump ranged between 1 and 5 in., and the most desirable seemed to be 2 in. The horizontal alignment deviated considerably at the start of the job, but as the men became more familiar with the operation, a great improvement was noticed. The average width was found to be 22 ft 3 in. which indicated that there was some lateral spreading. Thickness readings made by a transit revealed that 36% of the values deviated from the 9 in. required by ½ in. or more while 65% of the values deviated by ¼ in. or more. There was also a tendency for the

(Continued on page 132)

READY-MIXED CONCRETE is being dumped on the subgrade in front of the machine. The center two men are running a slump test. The slump ranged between 1 and 5 in., the most desirable being about 2 in. There was some lateral spreading.

"One-man gang"

lets you use low-cost air anywhere — replaces expensive specialized equipment

Le Roi TRACTAIR

Combination 35-hp tractor — 105-cfm compressor

Why rent or buy expensive specialized equipment? Save your money — because, for a fraction of the cost, you can do most of your jobs with Tractair and attachments.

Just look at what Tractair does:

First of all, Tractair gives you low-cost air power that is self-propelled! You don't tie up trucks or men for transportation. One man and Tractair put 105-cfm of air to work where and when you need it.

Secondly, attachments multiply Tractair's usefulness: With Le Roi-CLEVELAND air tools, you can break pavement, drill rock, dig clay, tamp fill, etc. With a front-end loader and attachments (8 accessories that interchange easily), Tractair loads, lifts, backfills, plows snow, etc.

Let this "one-man gang" show you at first hand all it can do to cut your costs. Ask your nearby Le Roi distributor to take you to see Tractairs at work.

Write for job-data sheets and bulletins.

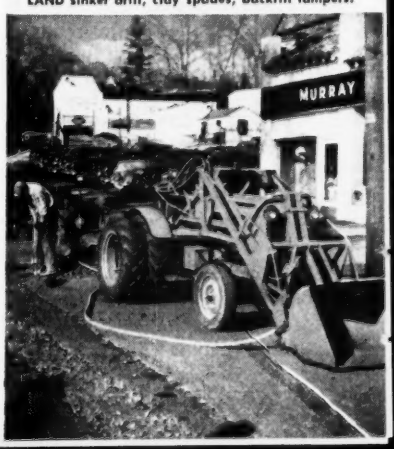
Compressors
Tractair
Rock Drills
Engines . . .

LE ROI COMPANY — MILWAUKEE 14, WISCONSIN

Plants: MILWAUKEE • CLEVELAND • GREENWICH, OHIO

T-26

Pavement Breaking — Here, Tractair runs a Le Roi-CLEVELAND Breaker. When the job is done, Tractair mops up with its front-end loader. You also can use Tractair to run a Le Roi-CLEVELAND sinker drill, clay spades, backfill tampers.



Nation-Wide Sales-Service Network

ALABAMA: Birmingham, Mobile — ARIZONA: Phoenix — ARKANSAS: Little Rock — CALIFORNIA: Bakersfield, Long Beach, Los Angeles, San Francisco — COLORADO: Denver, Grand Junction — CONNECTICUT: Hartford — FLORIDA: Jacksonville, Miami, Tampa — GEORGIA: Augusta, Decatur— IDAHO: Boise, Idaho Falls, Twin Falls—ILLINOIS: Chicago— INDIANA: Indianapolis — IOWA: Cedar Rapids, Des Moines, Waterloo — KANSAS: Great Bend, Kansas City, Pratt, Wichita — KENTUCKY: Lexington, Louisville — LOUISIANA: New Orleans, Shreveport — MAINE: Augusta — MARYLAND: Baltimore, Hyattsville — MASSACHUSETTS: Hyde Park, Newton Highlands, Worcester—MICHIGAN: Detroit, Grand Rapids —MINNESOTA: Duluth, Minneapolis — MISSISSIPPI: Jackson — MISSOURI: Joplin, St. Louis — MONTANA: Billings, Great Falls, Kalispell, Missoula — NEBRASKA: Omaha — NEW HAMPSHIRE: Manchester — NEW JERSEY: Cranford, Kingston — NEW MEXICO: Albuquerque — NEW YORK: Albany, Binghamton, Buffalo, Long Island City, Newburgh, Rochester, Saugerties, Syracuse, Whitesboro, Woodside (L.I.) — NORTH CAROLINA: Charlotte — OHIO: Cincinnati, Cleveland, Columbus, Dayton, Toledo — OKLAHOMA: Oklahoma City, Tulsa — OREGON: Portland—PENNSYLVANIA: Bethlehem, Harrisburg, Philadelphia, Pittsburgh — RHODE ISLAND: Providence — SOUTH CAROLINA: Columbia — SOUTH DAKOTA: Rapid City, Sioux Falls — TENNESSEE: Chattanooga, Knoxville, Memphis, Nashville — TEXAS: Dallas, El Paso, Houston, Lubbock, San Antonio — UTAH: Salt Lake City — VIRGINIA: Richmond, Roanoke — WASHINGTON: Seattle, Spokane — WEST VIRGINIA: Clarksburg, South Charleston — WISCONSIN: Milwaukee — WYOMING: Casper.

LE ROI *gives you more for your money!*

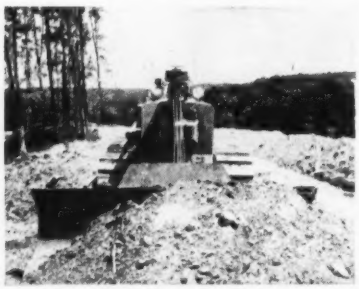
MORE UTILITY! MORE PROFIT!

Trac-Jac — A Le Roi-CLEVELAND air-feed sinker drill mounted on Tractair. Feeding and drilling controls are within easy reach of operator. The mobility of this unit makes it ideal for mud-jacking and many other applications.

Driving Form Pins — On this highway project, Tractair puts air power to work driving form pins prior to paving. This is another example of how the usefulness of Tractair helps you to do many different jobs, reduce costs.

Earth Drilling — Tractair with utility boom operates air-motor-driven earth auger up to 16" diameter — speeds up anchor-hole digging and other earth-drilling jobs. It's another way Tractair gives you extra hours of useful service.

Stops Dozer Rope Waste



A Reel of Tuffy Dozer Rope Can Save Up to 300%

When 10′ or so of Tuffy Dozer Rope is crushed or cut on the drum, don't throw the whole rope away. Just feed through enough to replace the damaged part! When you're using Tuffy, there is plenty of service left in the undamaged part. You get 6 to 9 cuts from one reel and, figuring roughly, there are *two* dozer ropes to *each* reel of Tuffy. That gives you an approximate ratio of 6 to 2 . . . around 300% increased service! And you can have your dozer back on the job in less than *half* the time usually needed! Tuffy ½" Dozer Rope is now furnished in 150′ reels. Write today for simple details on how to mount Tuffy on *your* Dozer!

MAIL COUPON TODAY

UNION WIRE ROPE CORP.
Specialists in Wire Rope and Braided Wire Fabric
2270 Manchester Ave., Kansas City 3, Mo.

Please send me the FREE illustrated folder on Tuffy Dozer Rope.

Firm Name_____

By_____ Title_____

Address_____

City_____ Zone___ State_____

C-14

FORMLESS PAVER

. . . Continued from page 129

edge of the pavement surface to settle, but the greatest percentage of this occurred while passing over a dangerously wet subgrade. Likewise, over this wet subgrade there occurred 50% of all the bumps, having a magnitude of ½ in.

As this was primarily an experimental job we were at no time interested in a speed record, but even so it was figured that we averaged almost 100 lin ft per hr, and considerable part of this time was waiting for concrete to arrive from the plant.

It is, of course, apparent from the test results of this job, that a great deal of improvement could be made in formless paving and that a great saving in cost could possibly be realized by a similar method of construction. As the highway grading field changed from mules to high-powered diesels, and as the paving mixers shifted from the low-capacity steam-operated mixers of yesterday, to the high-capacity mixers of today, we believe that with the adequate attention by the proper agency, this homemade paving machine could be a forerunner of a more economical machine of tomorrow.

Safer Power for You

HERE ARE SOME worthwhile tips on electrical equipment and power tools.

Don't attempt to repair defective wiring or other electrical equipment.

In case of overheating, sparking, or smoking motors, etc., turn off the power and call your foreman.

Don't use any electrical tools if your hands are wet or if standing on wet grounds.

All power tools should be grounded. On three-prong plugs this is done automatically when the plug is inserted. On tools using the standard two-prong plug there may be a built-in third wire in the cord with a clip attached. Attach this clip to a water pipe or other grounded object before the plug is inserted. If no clip is available, ground the tool by attaching one end of a wire to the metal frame of the tool and the other end to a grounded object.

Don't run cords through oil or water.

Inspect cords for worn insulation.

Big Saving On Rock Crushing Job!

"Best Wire Rope Service . . . on 33 Draglines"

Says Superintendent of a Florida Rock Crushing Company.
(Name on Request)

This construction company learned, by actual in-use tests on 33 draglines in their plants, that Tuffy's extra flexibility, extra abrasive resistance and extra toughness helped cut dragline costs 40%! On their first test, Tuffy went 26 shifts against 19 shifts for another make . . . on the second test, Tuffy lasted 19 shifts, the other rope only 9! See for yourself how Tuffy Draglines can move more material for longer periods for *you!*

UNION WIRE ROPE CORP.
Specialists in Wire Rope and Braided Wire Fabric
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Please send FREE illustrated folder on Tuffy Draglines.

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C-15

"MAGIC-CARPET" MAKER

SPREADS
Material Evenly

COMPACTS
to Uniform Density

LEVELS
Automatically
Without Forms

Barber BG Greene

THE BARBER-GREENE TAMPING-LEVELING FINISHER

When the job calls for the highest quality bituminous surface, you'll do it best with the B-G Tamping-Leveling Finisher.

With this superbly designed machine, you are able to lay every type of mix — hot or cold — from clay stabilized gravel to high-type sheet asphalt. Whatever type mat you are laying, the B-G Finisher automatically measures the correct amount of compacted material — then simultaneously tamps, levels and strikes off to produce a ripple-free surface that is maintained under rolling and traffic. Because the material is compacted while it is being laid, you are assured of a surface of uniform density. And with the B-G leveling principle you compensate even for abrupt changes in the subgrade.

It will pay you to investigate this unequalled, universally preferred method of paving streets, highways, runways, parking lots, tennis courts and similar jobs. You will learn, for example, how the B-G Finisher saves truck time, minimizes rolling and reduces the size of crew. Investigate today!

Barber-Greene BG

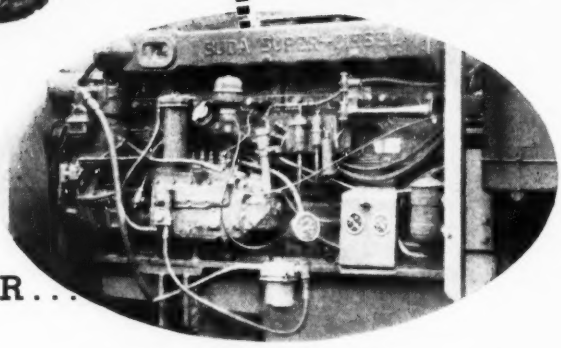
Aurora, Illinois, U.S.A.

BUDA DIESELS

POWER WORLD'S LARGEST TRUCK*

*Based on total tire capacity less net weight.

Model 600 Dart — 60 Ton Capacity. Powered by two Buda 8 DAS-1125 Super Diesels



One of two Buda Super Diesels powering new Dart 600.

BAGDAD COPPER *Again* PICKS BUDA DIESELS FOR *BIG* POWER... STAMINA... LONG LIFE!

Buda Diesels' superiority was demonstrated again when Bagdad Copper Mines picked two 8 DAS-1125 Super Diesels to power their new Dart 600 truck — called the largest truck in the world.

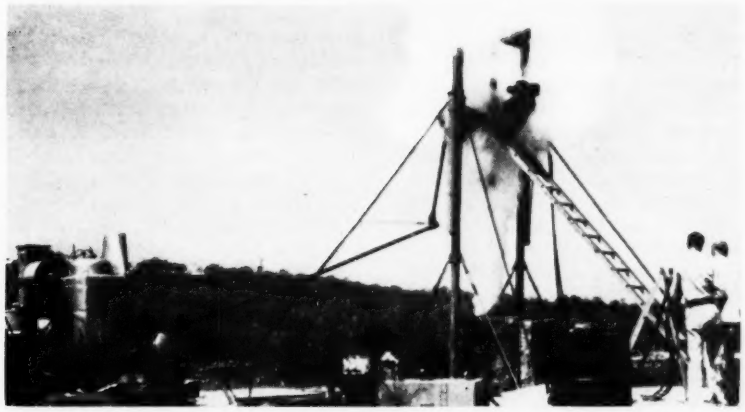
Deep, open pit mines are tough proving grounds for engines. The Buda Diesels powering other Bagdad haulage units are delivering such standout performance that Buda was the natural power choice for this giant new truck.

Your nearby Buda Distributor can show you how Buda Diesels will increase your equipment performance and profits. Ask him today. Write for Bulletins and data. The Buda Company, Harvey, Illinois.

BUDA

a Power-Full and Dependable Name in Engines

BC-32



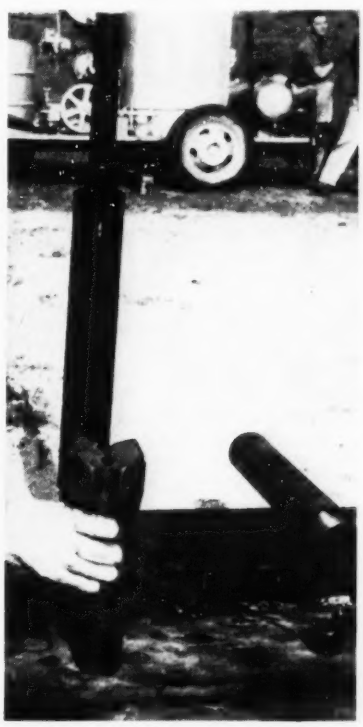
SHROUDED IN STEAM, new type of percussion rock drill cuts 4½-in. hole through 32 in. of granite in little more than 3½ min during test demonstration. Vapor-Clarkson generator (far left) supplies 2,400 lb of steam per hr at 400 psi to operate drill.

Steam Drives New Rock Drill

A NEW TYPE of steam-driven percussion drill, whose striking parts follow the bit down the hole, has just been put through tests in Texas. It drilled a 4½-in. dia hole through a 32-in. block of granite in only 1 min and 35 sec—a rate of 45 ft per hr.

The Bassinger drill is something

DRILL IS INSPECTED by its developer, Ross Bassinger, after removal from hole. Hands partly obscure drill's piston shaft, which reciprocates inside cylinder in drill pipe.



DRILL USES 4½-IN. BIT with carbide inserts. Standing behind it is opened cylinder showing upper half of double-headed free piston that hits 3,000 4-in. blows per min.

COMMENT
from the BUTLER ENGINEER

Coins of Far-flung Lands . . . and 3-D

Butler Plants — Roadbuilders and Ready Mixed, are "One-Worlders." That is to say, they are utterly without prejudice as to the currency in which they earn profits for their owners. To name only a few, Butler-batched concrete is paid for in rupees, cruzerios, bolivares, pesos, marks, francs and pounds . . . Maybe walrus tusks too, for we have several plants operating in the Arctic.

As my mind wanders over the countries represented by those coins, it occurs to me that those Butler Plant owners have paid us an extraordinary compliment. When you consider the length of time it takes for replacement parts to reach many of those global outposts — and consequently the horrendous cost in down-time — it's a reflection of high confidence that Butler was chosen.

Do you ever have to bid against tricky specifications? Electronic control devices? Automatic recording equipment? Automatic, interlocked batching? Just come to Butler if you have those problems . . . We're dealing with them every day — and love them.

And that's not to say we don't love the more conventional designing, too. Any plant of any size from small Roadbuilders' jobs to a mammoth Central Mixing Plant for the Corps of Engineers gives us joy. I guess we just love our work.

The local newspaper here in Waukesha carried the first 3-D advertisement in history. Those little polaroid glasses to view it were stitched on the page. Very effective. Lots of progressive things go on in Waukesha.

Better come up and see us sometime.

The Butler Engineer

BUTLER BIN COMPANY
WAUKESHA, WISCONSIN

like a miniature double-acting pile hammer, about 5 ft long and less than 4 in. in dia. Inside it is a free piston, with heads on each end, that operates on a 4-in. stroke and delivers up to 3,000 blows per min. The piston beats on a four-point carbide-insert bit attached directly below it.

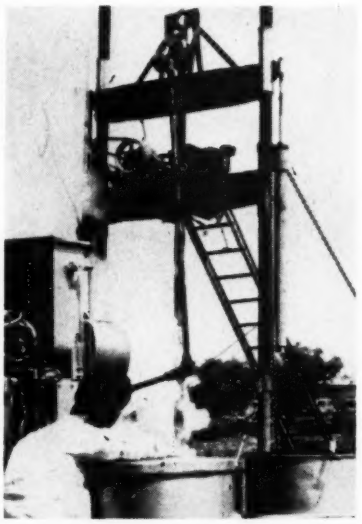
The device is threaded on the bottom of a string of 3-in. drill pipe, through which steam is fed to it. Exhaust steam escapes through a blow hole in the center of the bit to carry away cuttings.

It takes about 2,400 lb of steam per hr at a sustained 400-psi pressure to operate the 4½-in. drill. This is supplied by a portable Vapor-Clarkson steam generator that develops the required pressure in less than 3 min from cold water. A high-pressure steam reservoir on the generator smoothes out hammer operation. The steam itself lubricates the drill, with oil being injected into the steam at the rate of 1 qt per hr by a Texsteam pump as drilling goes on.

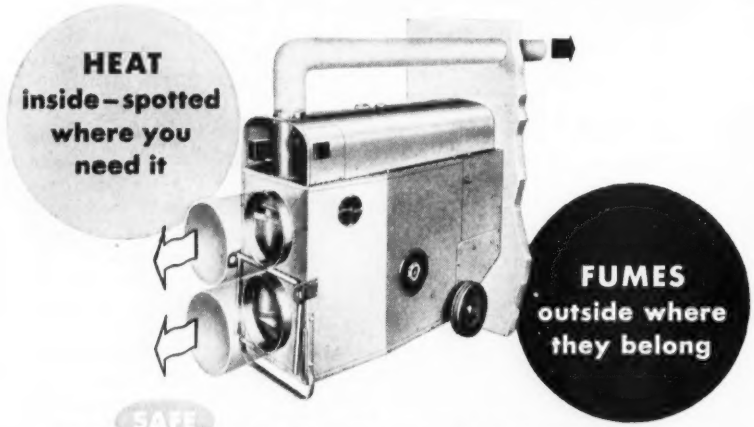
During operation, pipe string and drill are rotated by a small air-cooled gasoline engine coupled to a speed reducer. A second engine powers a hydraulic pump for raising and lowering them in the hole. For the test drilling, the drill-handling apparatus was mounted on a guyed pipe frame. A more efficient setup is now being worked out for mounting on a truck bed or trailer.

The new drill was developed by Ross Bassinger, who heads up the Bassinger Tool Corp., San Antonio, Tex.

ALL CONTROLS for drill operation—raising and lowering, rotation, and steam supply—are centered on one panel. Drilling speed is regulated by amount of steam fed to drill.



UPPER WORKS OF DRILL carry hydraulic raising and lowering mechanism and geared-down gasoline engine for rotating pipe string and drill bit. Guyed frame is test jury rig.



SAFE

HERMAN NELSON

PORTABLE AIR HEATERS

Built like a furnace, safe like a furnace . . . Herman Nelson Portable Air Heaters give you all the heat you want with none of the dangers of salamander-type units. All products of combustion are kept separate, and vented off—leaving only clean, pure, safe heated air. Absolutely no carbon monoxide, no smoke, no fumes, no sparks.

Use to keep working areas warm, to dry plaster or protect concrete pours, as emergency plant or warehouse heat. Ventilates as it heats. Lick winter slowdowns, keep men on the job in coldest weather. A Herman Nelson Portable Air Heater can pay for itself the very first winter, *this* winter. Act now. Mail coupon below.

Remember, Herman Nelson has the only complete line of completely safe portable air heaters. Models available from 125,000 to 450,000 BTU. Oil or gasoline fired. Electric or gasoline powered.

Herman Nelson Portable Air Heaters, another product of American Air Filter Company, Inc., Moline, Illinois.

Get all the FACTS about ALL Portable Heaters

American Air Filter Company, Inc.
Dept. 12, Moline, Illinois

Please rush my free copy of booklet "Guide to the Selection and Use of Portable Space Heaters."

NAME _____

COMPANY _____

TYPE OF BUSINESS _____

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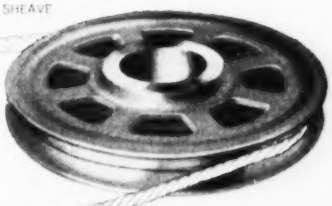
AMSCO

manganese steel sheaves extend wire rope life

OIL WELL SHEAVE

LADLE-CRANE HOIST SHEAVE



Wire rope replacements often cost more than the Amsco Sheaves that can minimize them.

Amsco Manganese Steel Sheaves work-harden under repeated impact and pressure, acquiring a polish that eliminates splintering. And because Manganese Steel Sheaves have high abrasion resistance they don't score.

Amsco Sheaves may be designed as single or double wall. The Double wall is particularly suited for applications involving extreme thrust.

BOOM POINT SHEAVE FOR POWER SHOVEL OR DRAGLINE

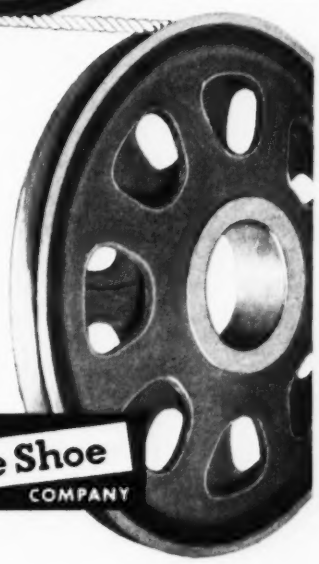
DOUBLE WALL SHEAVE

Cross section of an Amsco oil well sheave showing standard A.P.I. flange design.

Cross section of one type of Amsco Manganese Steel Sheave for industrial application.

Here is why Amsco Manganese Steel is called "the toughest steel known."

1. **12 to 14 percent Manganese**
2. **Work-hardens under impact to as high as 450-550 Brinell**
3. **Surface polishes to reduce wear, minimize need for lubrication**
4. **Strength and ductility for toughness**
5. **Readily weldable.**



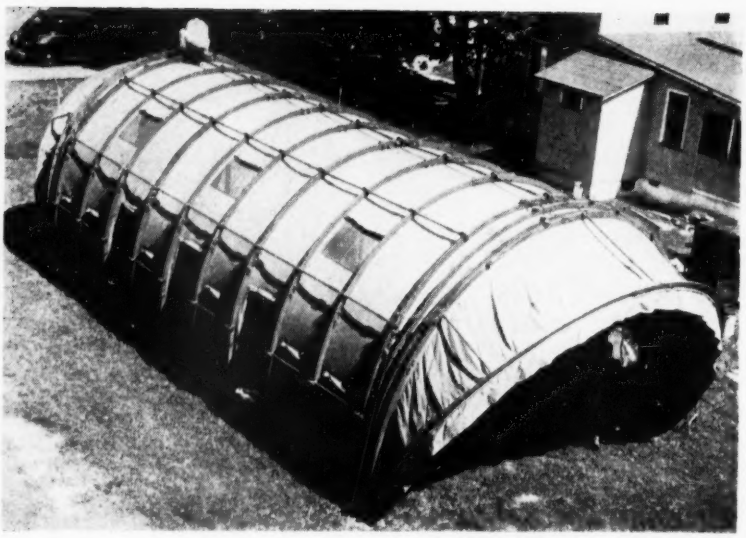
Write for your copy of the Amsco Catalog sheet for further details.

AMERICAN MANGANESE STEEL DIVISION

AMERICAN Brake Shoe COMPANY

385 East 14th Street · Chicago Heights, Ill. OTHER PLANTS: NEW CASTLE, DEL., DENVER, OAKLAND, CAL., LOS ANGELES, ST. LOUIS. IN CANADA: JOLIETTE STEEL DIVISION, JOLIETTE, QUE. AMSCO WELDING PRODUCTS DISTRIBUTED IN CANADA BY CANADIAN LIQUID AIR CO., LTD.

Shelter for Maintenance in the Field



A NEW KIND of maintenance shelter for military vehicles, highly portable and extremely light weight, has been developed for the Quartermaster Research & Development Division by the Evans Products Co., Plymouth, Mich., but could easily be used by contractors in the field.

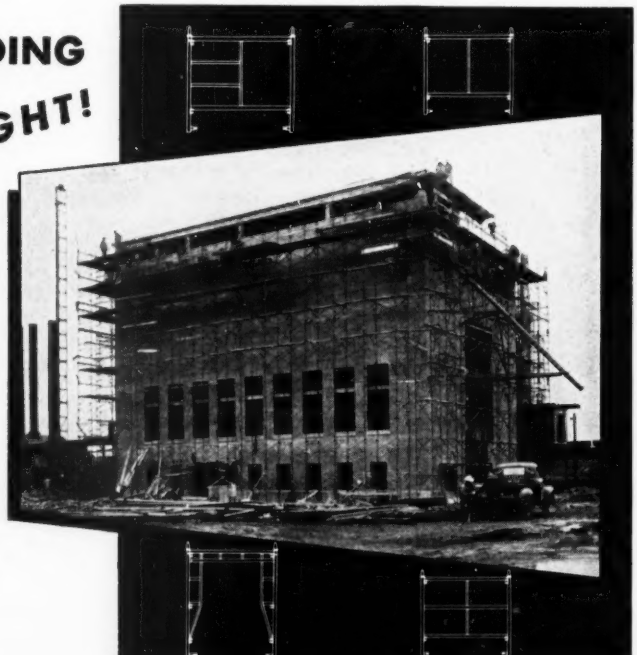
The new shelter, resembling a Quonset hut in shape, is 66 ft long, 21 ft wide and 15 ft high at its center. It consists of arched magnesium alloy frame sections over which is permanently fastened the canvas covering, complete with plastic skylights and portholes. The new shelter consists of five sections, and each section folds down into a package 4 x 10 ft x 15 in. deep. Total packaged weight, including insulating blankets for use in sub-zero areas, is 4,100 lb.

It is claimed the new shelter has several advantages over similar shelters of conventional design: (1) Extreme portability. Because of its comparatively light weight, compact construction and sectional assembly features, it can be easily moved by truck or plane from one field position to another; (2) Simplified construction. Where the conventional maintenance shelter, made of wood framework, requires longer to erect and also requires frequent repair and replacement of wooden frame members, the

(Continued on page 140)

ADVANCE TUBULAR STEEL SCAFFOLDING

Stacks RIGHT . . Holds TIGHT . . Sells on SIGHT!



Erection is handled quickly — without tools — when ADVANCE Scaffolding is on the job. Prefabricated, interchangeable panels stack one atop the other . . . fit perfectly, because they're held in place with patented, trigger-action Stack Locks. All braces have self-contained Cam Locks which fasten them securely to panels by merely pulling cam lever down. No bolts, nuts, clamps, or other needless methods of attachment are required.

You can erect ADVANCE Scaffolding easier, much faster, and for far less than you can build makeshift wood or outmoded metal scaffold. Dismantle, too, in minimum time without damaging materials.

Your ADVANCE Scaffold dealer carries a complete line of panel styles, brace sizes, and other accessories — all available for quick delivery on a sale or rental basis. Use the coupon below for free descriptive literature.

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Ellwood City 3, Pa.
Please send free literature on ADVANCE Scaffolding.

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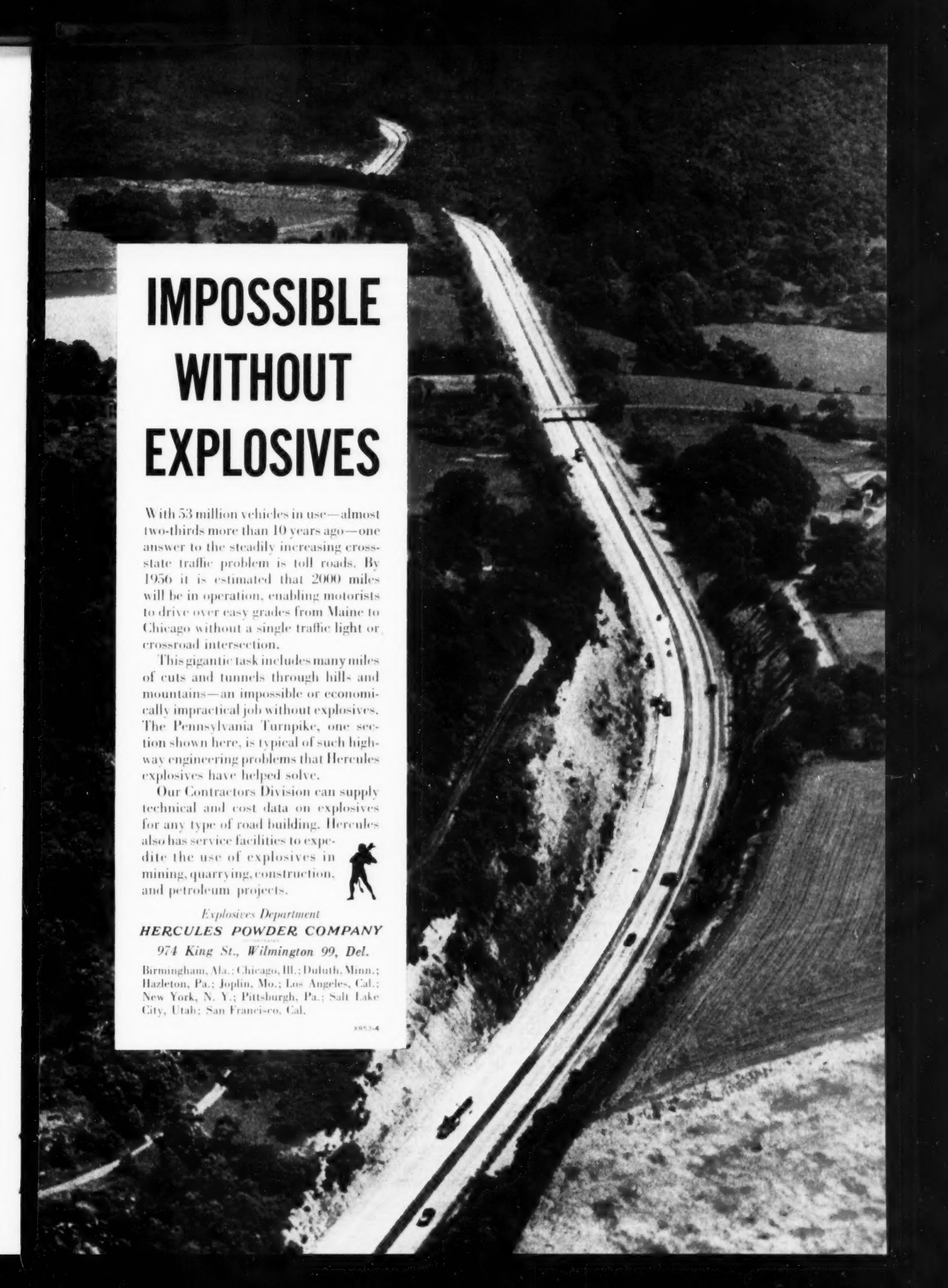
BEAVER ART METAL CORP.
ELLWOOD CITY, PA.
AND
MATHEWS CONVEYER CO. WEST COAST
SAN CARLOS, CALIFORNIA



IMPOSSIBLE WITHOUT EXPLOSIVES

With 53 million vehicles in use—almost two-thirds more than 10 years ago—one answer to the steadily increasing cross-state traffic problem is toll roads. By 1956 it is estimated that 2000 miles will be in operation, enabling motorists to drive over easy grades from Maine to Chicago without a single traffic light or crossroad intersection.

This gigantic task includes many miles of cuts and tunnels through hills and mountains—an impossible or economically impractical job without explosives. The Pennsylvania Turnpike, one section shown here, is typical of such highway engineering problems that Hercules explosives have helped solve.

Our Contractors Division can supply technical and cost data on explosives for any type of road building. Hercules also has service facilities to expedite the use of explosives in mining, quarrying, construction, and petroleum projects.

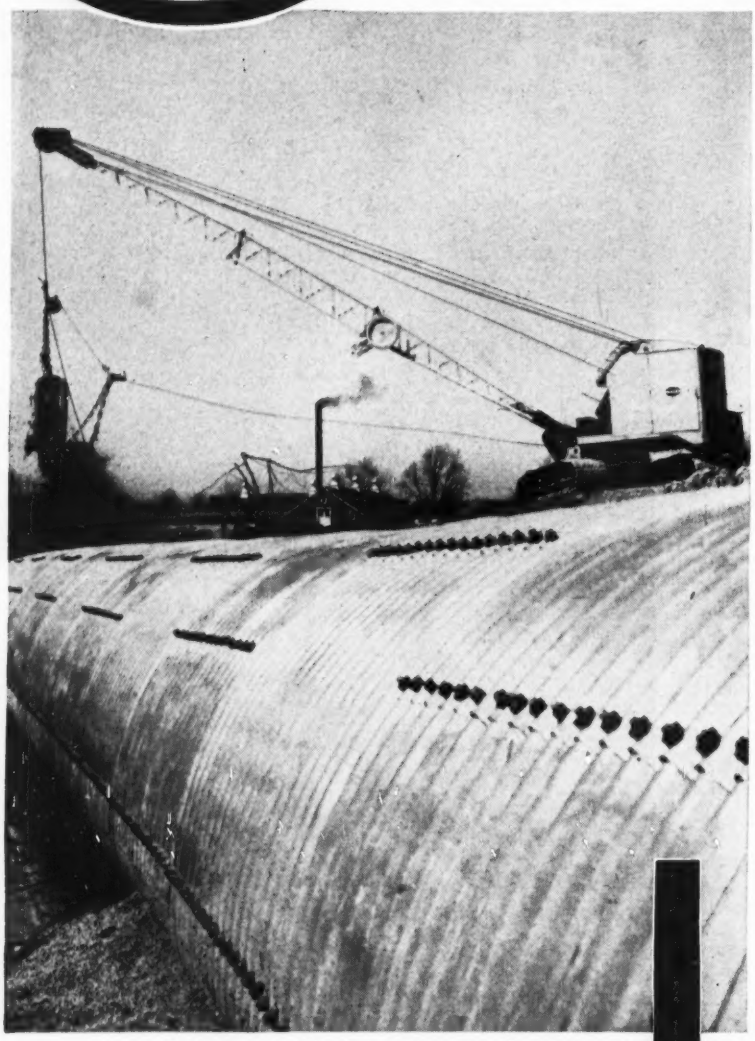
Explosives Department
HERCULES POWDER COMPANY
974 King St., Wilmington 99, Del.

Birmingham, Ala.; Chicago, Ill.; Duluth, Minn.; Hazleton, Pa.; Joplin, Mo.; Los Angeles, Cal.; New York, N. Y.; Pittsburgh, Pa.; Salt Lake City, Utah; San Francisco, Cal.

X853-4

THERE'S AN INSLEY WORKING NEAR YOU

BACKFILLING AFTER PIPE INSTALLATION



Insley Type K with Dragline attachment owned by the Central Engineering and Construction Co. of Indianapolis

The Insley Line includes excavators and cranes, 5 to 30 ton capacity • rubber or crawler mounted • gasoline, diesel or electric powered. There's an Insley working near you backfilling after pipe installation.

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THE MAXI CORPORATION, LOS ANGELES • SIX WHEELS, INC., LOS ANGELES

FIELD SHELTER . . .

Continued from page 138

new magnesium-framed shelter requires the time of only eight men 8 hr to erect and, once up, demands no further attention. (3) Light weight. It is only one-fourth the weight of the conventional shelter, yet provides 1,258 sq ft of floor area. Without its insulating blanket, the shelter weighs only 2,620 lb.

There are several unique features about the magnesium-framed shelter not found in others. At each end are buggy-top doors, hinged so they open from the bottom. When open, they can accommodate the largest Army tank and other vehicles as large as a moving van. The doors can easily be opened or closed in one minute by one man operating a small hand-powered winch built into the framework of the shelter. Because the ends of the shelter taper toward the ground, they offer less wind resistance than conventional rectangular shaped shelters. Wind tunnel tests run at the University of Michigan have proved the shelter can withstand wind velocity of 80 mph and gusts up to 100 mph, without failure.

Good Fastening

Another unusual feature of the shelter is the method by which the canvas is permanently fastened to the framework. Instead of using a series of becket ropes to tie the canvas to the frame at 18-in. intervals, thereby causing concentrated stresses, the canvas in the Evans-designed shelter is attached to the frame by rope welts sewed to the canvas and threaded through slotted openings located on the under side of each transverse arch. In this manner, each thread in the canvas is restrained under equal tension and for the first time in tent design, the ultimate strength of the fabric is developed and made available.

When unpacked and expanded for erection, the hinged framework arches are positioned on 4-ft centers by jackscrew purlins which also stretch the captive canvas taut. This eliminates the need for erection crews to pull or lift wet or frozen canvas. Zippered doors in the sides of the shelter give maintenance men easy access to the structure. Blackout curtains are also part of the shelter's equipment.

The shelter is designed for use in all climates. It can be expanded if necessary simply by adding extra unit segments.

WHAT ADVANTAGES DO YOU GET IN 4-WHEEL TRACTORS FOR SCRAPER OPERATION?

SINGLE AXLE PRIME MOVERS with overhung engines have some desirable features for scraper work or you wouldn't see them on many jobs. They may even outperform 4-wheel scraper tractors on an occasional job, but when you tally production and costs on all kinds of work for the life of the unit, the performance records of 4-wheel tractors tell the real story. Here are some of the factors to consider when you're comparing scrapers:

EXCELLENT MANEUVERABILITY

SAFETY AND STABILITY of the Euclid 4-wheel tractor permits full use of all the power and speed provided by the 275 h.p. engine and 10 speed transmission. Two axles assure positive steering and maximum safety under all road conditions and at any speed.

FAST, EASY LOADING is a feature of "Euc" scraper design. Cutting blade consists of 4 identical, reversible and adjustable sections providing the most efficient blade arrangement for any type of material. Short pull arms provide maximum rigidity of blade and entire scraper during loading. "Eucs" get more compacted loads and by actual scale weight carry more pounds of payload.

MANEUVERABILITY and ease of operation result from short wheel base of tractor, hydraulic booster steering, individual steering brakes on drive wheels and independent lever action control of all scraper operations. Complete 180° turn, non-stop, requires only 38'. . . less than many single axle tractor scrapers as shown in their specifications.

SAFE, FAST TRAVEL SPEED

JOB AVAILABILITY is especially important because of the heavy demands on tractors in scraper operation. "Eucs" have years of job proved performance with excellent accessibility of all working parts for servicing and maintenance. For example, service work on the entire drive axle and differential assembly of the Euclid tractor can be done without even removing a tire . . . in about one-fifth of the time required for similar work on single axle tractors. And there's no down time due to cable breakage either, because of Euclid lever action.

HAVE YOUR EUCLID DISTRIBUTOR give you complete specifications and performance data on Euclid 12 or 15.5 cu. yd. scrapers. He has a new folder, Form No. 502, that shows why "Euc" scrapers with 4-wheel tractors can out-perform all other scrapers of comparable size.

The EUCLID ROAD MACHINERY Co., Cleveland 17, Ohio

EUCLID (GREAT BRITAIN) LTD. • GLASGOW, SCOTLAND

CABLE ADDRESS: YUKLID CODE: BENTLEY

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

LEADING CONTRACTORS USE McCarthy Drills

PUBLIC UTILITY AUGER DRILL

Bores holes from 4½" to 24" in diameter under sidewalks, roads, building foundations, railroad tracks, landscaped grounds, etc. Fithian Contracting Co., Youngstown, O., using McCarthy Public Utility Auger Drills, completes pipe line jobs, formerly taking weeks, in a few days.

SELF-PROPELLED HORIZONTAL AUGER DRILL

Will bore 6" and 8" diameter holes 120 feet horizontally at rate of six feet per minute maximum. Four individual, self-locking jacks maintain correct drilling level. In one day a New Castle, Pa., operator bored holes of various depths totaling 840 ft. through shale and sandstone, using this McCarthy Auger Drill.

Heavy-Rugged Powerful

VERTICAL AUGER DRILL

Operating men who have made actual on-the-job tests find the McCarthy Vertical Auger Drill a standout for mobility, stamina, ruggedness and versatility. On a 2-million dollar, 5-mile stretch of superhighway between Hubbard, Ohio, and Sharon, Pa., The Apex Powder Co., Canton, Ohio, cut blasting costs approximately 20% as compared to air, well or churn drilling. Cutting through two large areas of concentrated rock, 150 holes 15 feet deep were bored for each blasting pattern. 3,000 cubic yards of sand rock were moved at each blast. Due to the ruggedness and mobility of McCarthy Drills, there was no time lost. For further information, write Salem Tool Co. and our distributor will contact you.

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THE SALEM TOOL CO.

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DANGEROUS AND WORN-OUT BRIDGES such as this one are easily replaced with the use of precast reinforced bridge slabs manufactured by Choctaw, Inc., of Memphis.

CHIEF ADVANTAGE of using the precast slabs on bridge replacement is speed. It's entirely possible to lay the slabs and have the bridge open for traffic in 1 hr.

HOLES ARE PROVIDED in the curb section to which guard rail posts may be bolted for the erection of beam-type guard rails. The slabs are produced in 15- and 19-ft lengths.

Concrete Slabs Make Good Replacement

PRECAST, REINFORCED CONCRETE bridge slabs for use on highway and road construction and for replacement of worn-out bridges is proving to be faster and more economical than ordinary methods, according to one manufacturer, Choctaw, Inc. of Memphis, Tenn.

The speed with which a precast concrete bridge may be erected and ready for use is one of its chief advantages. It's entirely possible to erect one and have it open for traf-

fic in approximately 1 hr. The concrete slabs are delivered to the site of the construction, and a lift crane makes short work of unloading and placing them into position.

The slabs, manufactured by Choctaw, Inc., in both Memphis, Tenn., and Little Rock, Ark., were designed by the Arkansas Highway Department for H-15 loading and are of channel design with a diaphragm across the ends and center. The interior units have a monolithic curb section. Two bolts connect the sections transversely and one bolt hole is provided in the ends where multiple spans are used.

The slabs may be placed on timber piles with timber caps, and they have been used with concrete piles and concrete caps, as well as timber piles and concrete caps. Holes are provided in the curb sections to which guard-rail posts may be bolted for the erection of beam-type guard rails. By the use of various combinations of number of units, bridged 20, 22 or 24 ft wide, or even wider, may be erected.

Beats Design

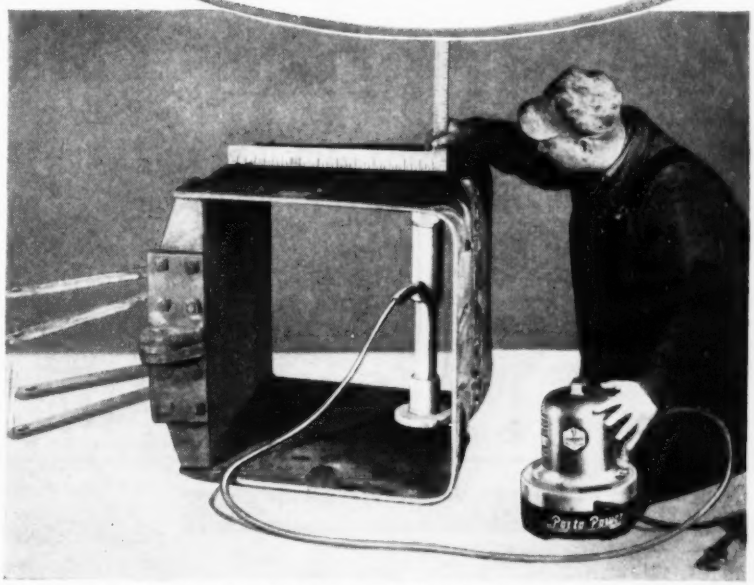
Actual loading tests were made by the Arkansas Highway Department on individual slabs, and it was found that they actually sustained H-20 loading without failure. Although the slabs are designed on the basis of 3,000-lb concrete, tests proved the concrete being used is actually giving results of 5,000 psi in cylinder tests.

The precast bridge units are manufactured under rigid control in heavy steel forms. The concrete is vibrated with internal vibrators and the units steam cured. They are held to tolerances of ¼ in. in 19-ft lengths with ⅛ in. in vertical direction. They are produced in 15- and 19-ft lengths.

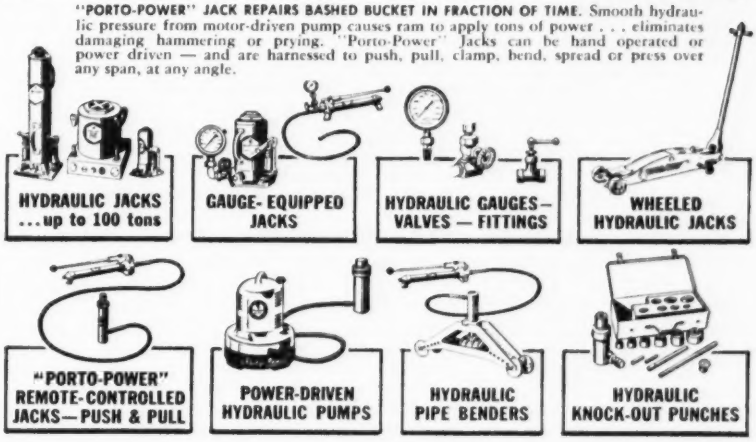
These slabs have been approved by the U. S. Bureau of Public Roads for Federal Aid construction and have already been installed on four projects in Arkansas.

Pick the right jack for the job

...from the world's most complete line of hydraulic jacks



"PORTO-POWER" JACK REPAIRS BASHED BUCKET IN FRACTION OF TIME. Smooth hydraulic pressure from motor-driven pump causes ram to apply tons of power . . . eliminates damaging hammering or prying. "Porto-Power" Jacks can be hand operated or power driven — and are harnessed to push, pull, clamp, bend, spread or press over any span, at any angle.



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Save buying time when you need hydraulic equipment. Specify Blackhawk—and be sure you'll get the hydraulic tool that will match your requirements exactly. Order from leading supply houses. Write for free catalogs. Products of Blackhawk Mfg. Co., Dept. 1-2593, Milwaukee 1, Wisconsin.

On-the-Job
CONTRACTOR-LABOR RELATIONS

by LEON B. KROMER, JR.

Carpenters???

LAST MONTH, quietly and unobtrusively, the Brotherhood of Carpenters dropped a bombshell on the construction industry. The big international with an estimated membership of more than 800,000 withdrew from the American Federation of Labor. Industry circles, totally unprepared, tended to discount the rumor that a pending marriage of the carpenters with John L. Lewis' union and dissident CIO unions was a possible cause of the divorce. They suspect the carpenters were incensed over the no-raiding agreement entered into by the A.F. of L. and C.I.O. when, at the same time the carpenters are harassed by long-standing unresolved jurisdictional disputes with A.F. of L. unions not affiliated with the building trades.

Best known and probably the most costly to contractors is the dispute between the millwrights and machinists over the installation of machinery. The machinists have been in and out of the A. F. of L. a number of times over this issue. When they returned to the fold the last time, it was with the understanding that jurisdictional claims between them and other A. F. of L. unions would be ironed out. This did not happen. The machinists then pressed their claims against the carpenters over machinery installation with the National Labor Relations Board and won in several instances.

The action of the carpenters has serious implications. For contractors the following questions immediately came to the fore:

1. Does withdrawal mean that the carpenters are automatically out of local building trades councils?

2. Will the carpenters go all out on jurisdictional claims?

3. Will the carpenters be permitted to remain in the National Joint Board for Settlement of Jurisdictional Disputes?

So far as is known at present, it appears the answers are:

1. Yes. George Meany, president of the A. F. of L., indicated at a press conference that he expected the local carpenters unions to be expelled from building trades councils. Enforcing such an order is another matter.

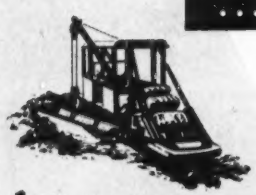
2. Not necessarily. In some areas contractors will be faced with jurisdictional claims by carpenters; in others it is expected that carpenters will work in harmony with the local building trades unions. In New York, which has had an arbitration procedure for settling jurisdictional disputes, Charles Hanson, president of the New York Carpenters District Council, indi-

(Continued on page 147)

It takes a FULL team

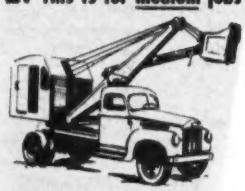
. . . whether it's surgery

. . . or digging equipment



1. This is for big jobs

2. This is for medium jobs



3. Sherman for all other jobs

On many excavating jobs the use of big equipment is costly and time-consuming. The Sherman Power Digger is designed so that you get all the advantages of power digging on these jobs. Thousands of users have proved that the Sherman Power Digger reduces costs. Write today for descriptive literature U45.

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Ingersoll-Rand CONTRACTORS' COMBINATION

I-R PAVING BREAKERS
matched to the job

PB-8

82 lb.

HEAVY-DUTY BREAKER AND PILE DRIVER

For the toughest kind of work — on reinforced concrete or extra-hard pavement construction. Interchangeable front heads available for pile or spike driving.

PB-6

58 lb.

MIDDLE-WEIGHT BREAKER AND SPIKE DRIVER

A heavy-duty machine with lighter weight for easy handling on less strenuous breaking or trenching jobs and on horizontal demolition work.

PB-59

40 lb.

LIGHT-WEIGHT DEMOLITION TOOL AND DIGGER

A light powerful breaker, especially desirable when working from scaffolding; when equipped with proper accessories it becomes a heavy duty digger or a clay spade.

L-29

20 lb.

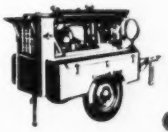
LIGHT-WEIGHT PICKHAMMER AND DIGGER

A handy, light-weight tool with ample power for demolition work on loose brick, mortar, plaster, clay digging and similar light-duty applications.

. . . and powered by the sensational

GYRO-FLO

Rotary Compressor



● For maximum work with minimum effort, it pays to match the breaker to the job. A heavy machine where weight is needed — a lighter machine where easy handling is more important. There's an I-R breaker that's *right* for every job —right in weight, power and cost.

Supply these I-R breakers with steady, constant air pressure from an Ingersoll-Rand Gyro-Flo rotary portable, and you've got a combination that's tops in operating efficiency and earning power. Write or phone for further details. 932-5

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PER POUND OF MATERIAL HANDLED

Armco Corrugated Metal Pipe is strong, yet light in weight. In contrast, rigid sectional pipe and monolithic box structures of the same capacity weigh about ten times as much. This means you can install ten times more Armco Pipe per pound of material handled.

With the high cost of today's labor and equipment, this savings in handling can be tremendous. In addition, installation goes along faster and easier. Jobs are completed ahead of schedule. This means more profit for you.

But let's get specific. Suppose you need a 15-inch diameter culvert, 40 feet long. Then you should have two 20-foot lengths of Armco Pipe, plus one coupling band. Each 20-foot length, in 16-gage, weighs 260 pounds. So the total handling weight, including coupling band, would be *only 530 pounds*—an easy, two-man task.

There is an Armco Drainage Structure to answer almost every drainage problem —in the right style, size and protective coating. Write us for recommendations. Armco Drainage & Metal Products, Inc., 4382 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. Export: The Armco International Corporation.

ARMCO DRAINAGE STRUCTURES

ARMCO

This truck is carrying 408 feet of Armco Pipe, ranging from 12 to 60 inches in diameter.

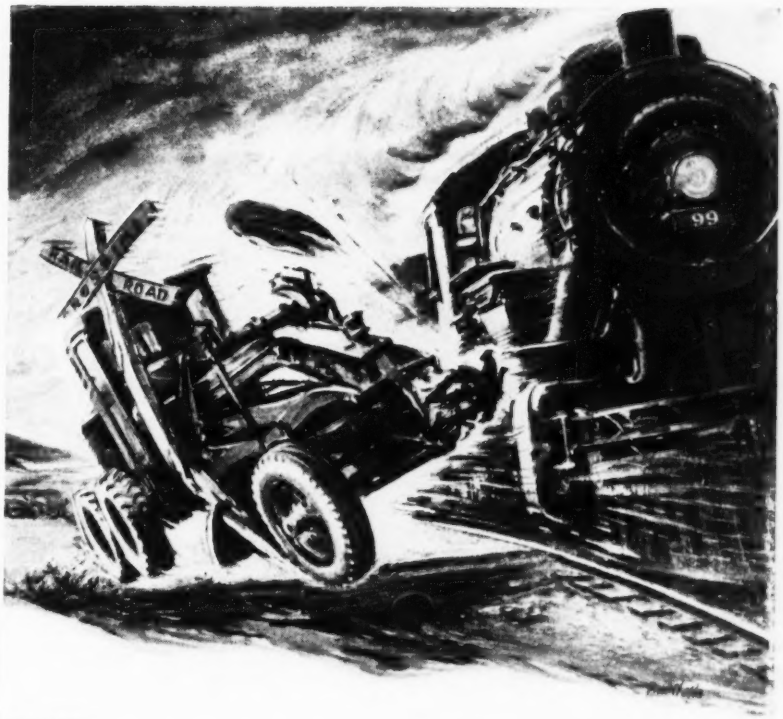
LABOR . . . Continued from page 144

cated that his group would no longer adhere to the plan, stating, "We'll look out for ourselves instead of arbitrating". This could spell the end of the plan which has been followed for more than 50 yr and cripple New York's big construction industry by a rash of jurisdictional strikes. Spot checks in other areas indicate that local councils still consider the carpenters members and intend to keep them unless they walk out themselves.

3. It is still not known whether the carpenters will remain on the National Joint Board. They could be expelled on a number of counts. The agreement that set up the Joint Board was negotiated by the 19 international unions of the Building Trades Department with the Associated General Contractors and specialty contractors associations. This agreement was included in the constitution of the Building Trades Department. On the union side it is strictly a building trades show, with all union Board members affiliated with international unions of the building trades. It will probably be necessary to revise the agreement in order to permit the carpenters to remain on the Board. That would take a lot of time. While adopting a cautious "wait-and-see" attitude, contractors should take special precautions to avoid jurisdictional disputes by adhering strictly to local area practices on work assignments. Remember, if disputes do develop, it may be possible to handle them as heretofore; i.e., through local plans or by referral to the National Joint Board, but if these methods fail, it is anyone's guess as to the outcome.

Taft-Hartley

Senator Taft had a profound interest in the future of this law which he co-authored. While he was its staunchest defender, he was eager to propose amendments that would correct mistakes in the original law. Last spring he introduced bills which would permit contractors and building trades unions to enter into collective agreements prior to the commencement of construction. (CM&E, April '52, p. 142). His death will undoubtedly have the effect of postponing, if not halting, corrective legislation as there is apparently no one at present prepared to fill his place.



When our grader took on "old 99"...

(A true story based on Company File #60708)

Maybe the operator was extra anxious to get home. Maybe the August heat was just too much for him.

Anyway he steered our big diesel grader onto the railroad tracks never looking to see whether a train was near!

One was. He couldn't, of course, get the grader out of the way in time and "old 99" knocked it off the tracks. Damage—$1445.

But, because we had a Contractors' Equipment Policy, the repairs didn't cost us a dime!

The repair bill was paid by the Hartford Fire Insurance Company under its Contractors' Equipment Policy.

This policy reimburses you for loss or damage to equipment caused by fire, theft, explosion, collapse of bridges, collision, overturn, landslide, windstorm and other specified hazards.

It doesn't matter whether the equipment is on the job, in transit, or in storage.

And any additional contractors' equipment you buy is *automatically covered for 45 days* even if you haven't reported it.

When the next accident happens don't be the one who has to lay out cash for repairs or replacements. You needn't if you act now. Begin by calling your Hartford Fire Insurance Company Agent or your insurance broker.

Year in and year out you'll do well with the

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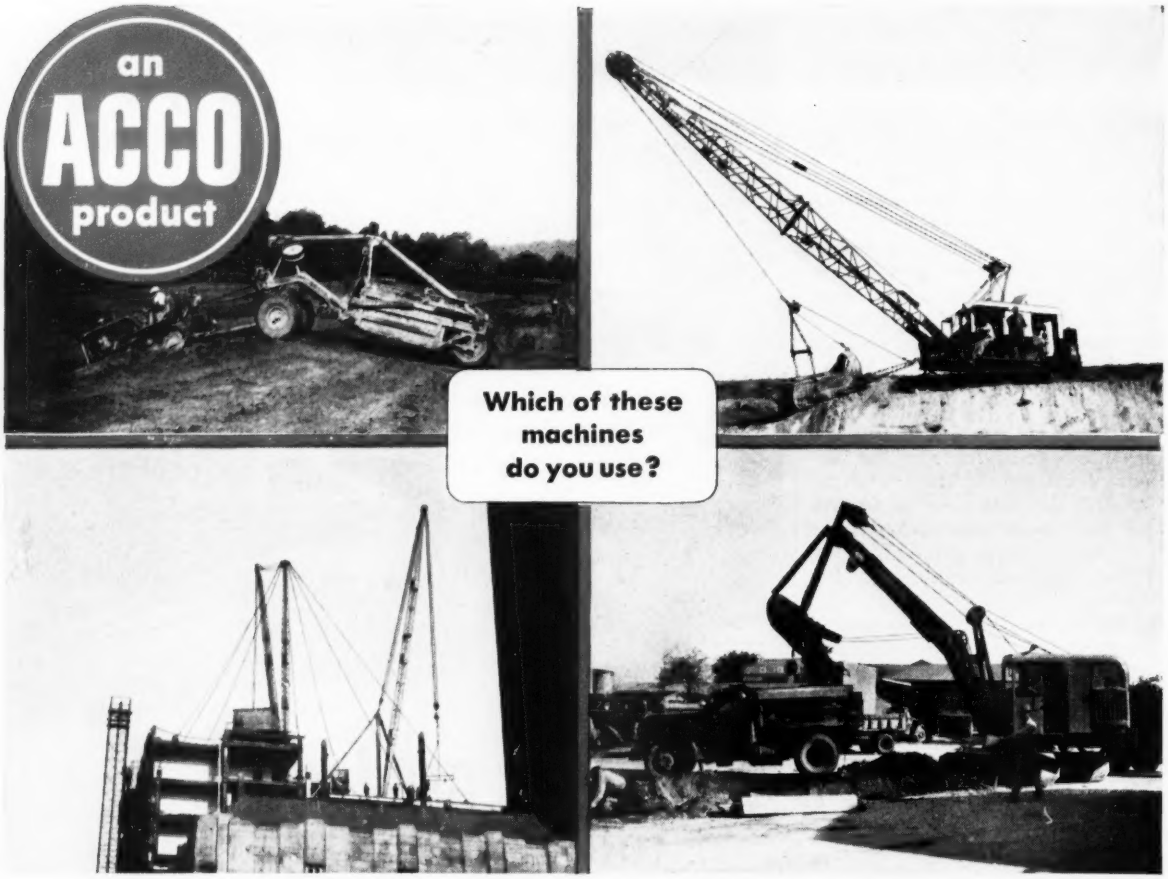
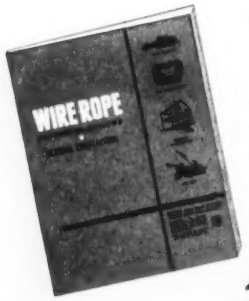


How You Can Reduce Wire Rope Costs with HAZARD LAY-SET Preformed

• Selecting the correct wire rope for each machine you operate is the most important factor in lengthening rope life and reducing costs. HAZARD has simplified the job by compiling modern *"Wire Rope Recommendations for General Contractors."*



Based on Field Tests—These recommendations are based on thousands of applications carefully watched by HAZARD field men on every conceivable type of equipment you use. You can get the benefit of the successful, and economical, use of LAY-SET "Green Strand" Wire Rope by operators in every field of contracting if you switch to HAZARD.

Every Wire Rope You Need—HAZARD makes all types, grades, and constructions of wire rope in all popular sizes. HAZARD distributors everywhere carry stocks to serve you promptly. Try a HAZARD Wire Rope next time and see the difference it makes.

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A. Gar-Bro Buckets eliminate scaffolds, ramps, elevators. They fly thru the air to deliver concrete faster to the form or receiving hopper. Gar-Bro patented Accordion Hopper and/or Elephant Trunk prevents segregation and loss of concrete due to spillage.

B. Gar-Bro Portable Hoppers keep truckmixers free and your crews active. No delays, no idle periods and no penalties. They are low enough to be filled by truckmixer.

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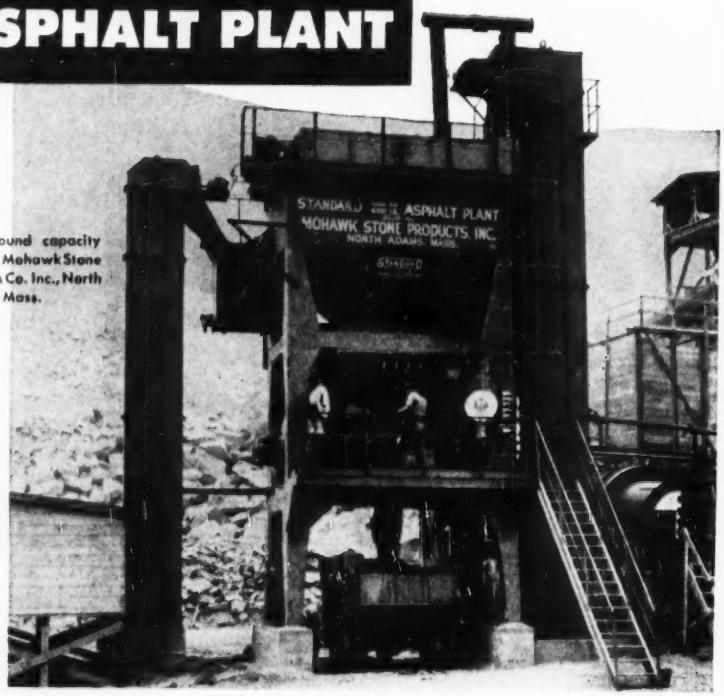


4000 pound capacity plant of Mohawk Stone Products Co. Inc., North Adams, Mass.

Keynote of the ever increasing popularity of the *Standard R. B. Asphalt Plant* is BALANCED PERFORMANCE. You can depend on the *Standard R B.* to deliver greater output with ease – because there are no bottlenecks. Features like extra large dryer capacity and oversized elevators, extra large vibrating screens and air handling systems assure this fact. As one operator puts it, "*You get amazing high capacity and just breeze along with a Standard Plant, whereas you would have to push everything at top pressure and not reach the same capacity with a competitive plant.*" Yes, the *Standard R. B.* outperforms them all. *Watch it in action and you'll join the hundreds of operators all over the continent who are "*Switching to Standard*". **Unit built—8 sizes, 500 to 6000 pound batch capacities. Send for full descriptive literature today.**

STANDARD

***There is a STANDARD Plant in operation near you. Write us for its location.**

STANDARD STEEL CORPORATION

5089 Boyle Ave., Los Angeles 58 • 7 East 42nd St., New York 89

BIG JOBS OF THE MONTH

Continued from page 22

Corbetta Construction Co., 220 E. 42nd St., New York 17. Reconstructing Dry Dock No. 3, New York Naval Shipyard for Third Naval District, Brooklyn, N. Y., Public Works Office 90 Church St., New York 7. More than $8,967,000.

G. L. Tarlton Contracting Co., 5505 Dale Ave., St. Louis 10, Mo. Expansion of Navy facilities at McDonnell Aircraft Corp. plant for Bureau of Yards & Docks, Navy Dept., Robertson (St. Louis 21 P.O.) Mo., $4,800,000.

Engineering Construction Co., First National Bank Bldg., Tulsa, Okla., Gas transmission lines from Knoxville to upper East Tennessee for Tennessee Natural Gas Co., Kingston Pike, Knoxville, $6,000,000.

Quaker Valley Constructors, Inc., Orange, Tex. chemical plant on 310-acre site at Orange, Tex. for Spencer Chemical Co. of Texas, c/o Kenneth Spencer of Orange, $22,000,000.

Peter Kiewit Sons' Co., 442 Post St., San Francisco, Calif. and **Parish Brothers,** Benicia, Calif., main Monticello Dam on Solono project, Calif., for U. S. Bureau of Reclamation, Dept. of Interior, City Hall, Winters, Calif., $7,628,991.

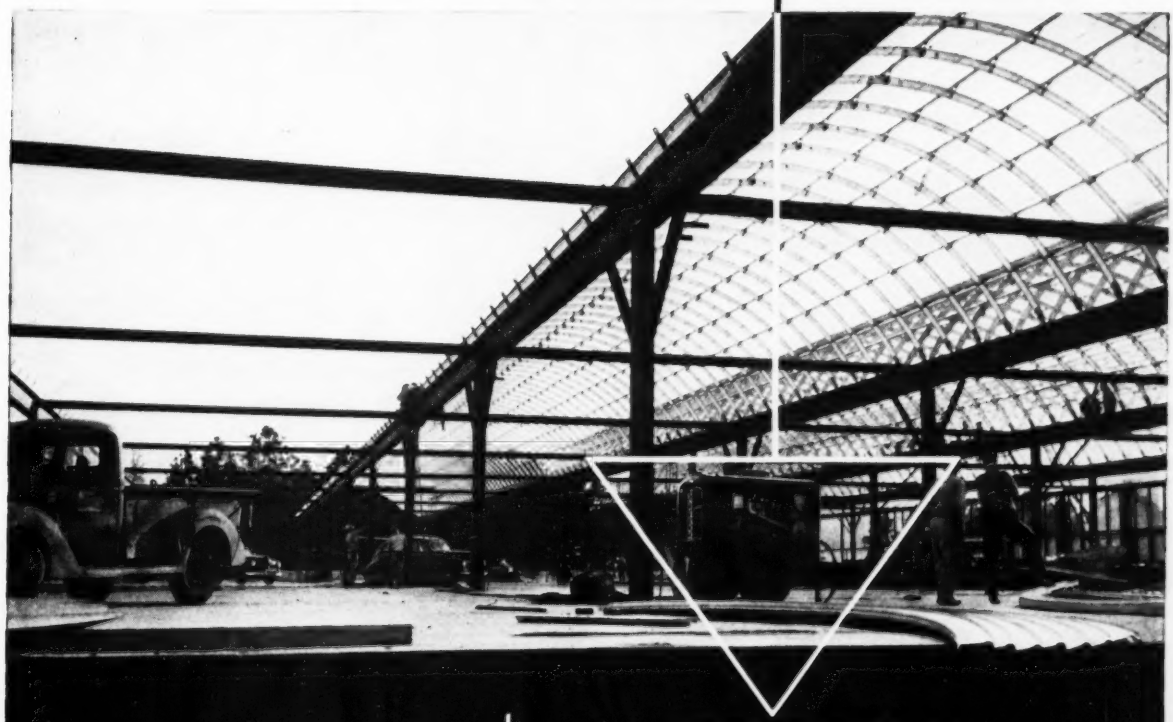
Turner Construction Co., 161 E. 42nd St., New York City, 42-story office building, Lexington & Third Ave., New York City for Galbreath Corp., 150 E. 43rd St., New York City, $45,000,000.

H. B. Zachry Co., Box 2570, San Antonio, Tex. Laying 154 mi 16-in. crude oil line from Corsicana to Ringgold, Tex. for Magnolia Pipe Line Co., Magnolia Bldg., Dallas, Tex., $3,520,000.

Del E. Webb Construction Co., 5101 San Fernando Rd., Los Angeles, Calif. 8-story reinforced concrete hotel at Beverly Hills, Calif. for Beverly Hills Development Co., 523 West 6th St., Los Angeles, Calif., $14,000,000.

Terry & Wright and **Calumet Paving Co.,** W. 8th St., New Albany, Ind., bridges; 11.5 mi grading; drainage structures; paving in Fulton Co., for Ohio Turnpike Comm., 139 E. Gay St., Columbus, $6,588,-822.

SPEED? | SAVINGS?



You get both with | SCHRAMM AIR COMPRESSORS

Here you see a Schramm Model 60 *UnisTage* Air Compressor furnishing air for Steel Fabricators operating nut runners on a job by McRan Company, Houston, Texas.

Regardless of the job, Schramm Compressors provide *speed* and *economy*.

Schramm advantages:

FUEL SAVINGS UP TO 50% . . . Pneumastat Control

SIMPLIFIED DESIGN . . . Eliminates two-staging and intercoolers

SAFETY FEATURES . . . Electric Push-Button starter

GREATER VOLUMETRIC EFFICIENCY . . . Mechanical Intake valve.

Schramm also offers a line of auxiliary tools ranging from rock drills to air hose and accessories, all designed to make your air job easier, better!

Write today for information on Schramm Compressors and tools.

TOOL SELECTOR

Here is a helpful way of determining tool capacities that removes all doubt and confusion in selecting the proper combinations for your job, no matter how large or small.

Sent **FREE** upon request.

Write on your business letterhead or enclose business card and address reply to SCHRAMM, INC., Dept. SMH, West Chester, Pa.

SCHRAMM, INC. • *The Compressor People* • WEST CHESTER, PENNSYLVANIA

SCHRAMM AIR COMPRESSORS

A SIZE AND MODEL FOR EVERY AIR NEED

HERE'S A FAST, positive economical method of removing the berm or ridge of sand and dirt from beneath roadside fences. The first unit was made from scrap materials.

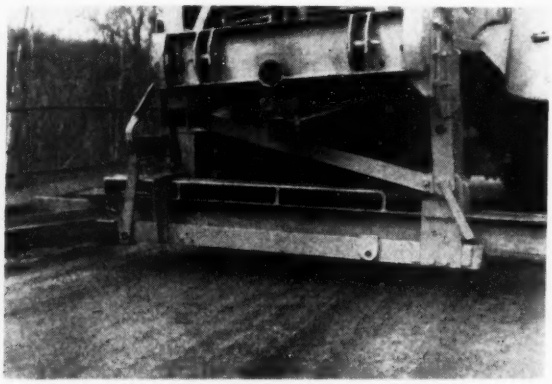
Power Scraper Clears Highway Shoulders

EARTH BERMS along highway pavement edges and beneath roadside fences—accumulations of winter sand, dirt and vegetation—are given the quick brush-off in Connecticut by hydraulically actuated scrapers mounted across the front of a highway department truck.

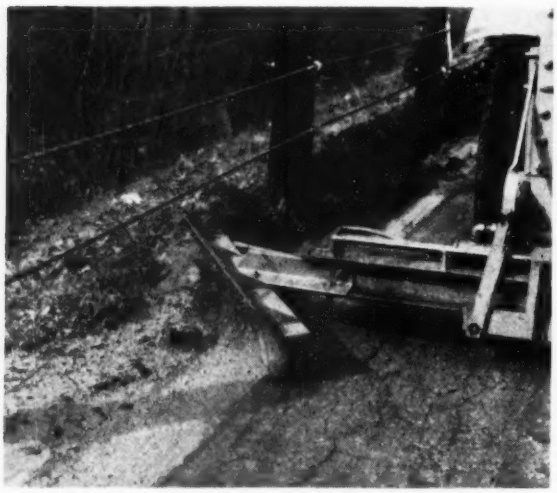
The first unit, built of salvaged materials in one of the department's shops, cost about $200. It is

(Continued on page 155)

UNIT ATTACHED to an FWD truck uses two moldboard attachments. One windrows, and this one casts material over the edge.



ATTACHMENT CONSISTS of a double-acting hydraulic cylinder mounted on slides which are attached to a 7-ft. H-beam.



IT REQUIRES only 2 min to remove one blade and attach the other. Berm can be removed at the rate of 3,500 ft. per day.

HERE'S THE COMPLETED JOB ready for oiling as a final stabilizing operation and to help prevent future vegatative growth.

here's muscle to move mountains

IN 6 YARD BITES!

LIMA TYPE 2400—The largest member of the Lima family is engineered and constructed for heavy duty service with higher dump, greater reach, and faster digging cycle.

EASY INSTANT CONTROL — Smooth, "Precision" air control of travel and operating motions lessens operator fatigue. Anti-friction bearings, reduce power robbing friction and step up efficiency.

BIG YARDAGE PRODUCER— Maximum power and fast digging cycles originate from a husky 12 cylinder Diesel engine of approved make. Equipped with torque converter power take-off.

LOW OPERATING COSTS — Truck and rotating bases are integrally cast for extra-rigidity and long life. Adjustments rarely needed on full mechanical clutches. Easy maintenance.

Offices in Principal Cities of the World

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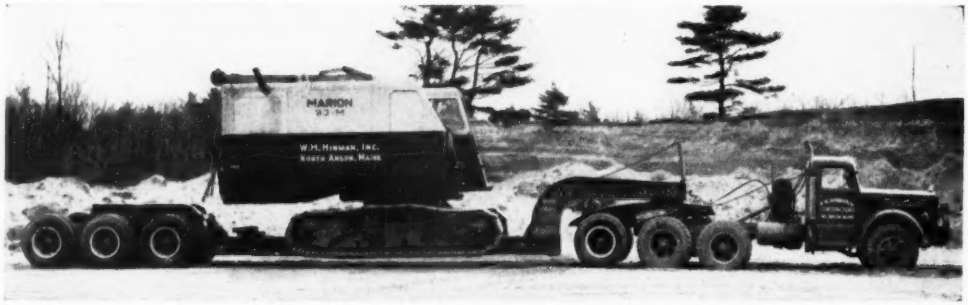
SHOVELS • CRANES
DRAGLINES • PULLSHOVELS

BALDWIN BLH LIMA-HAMILTON
Construction Equipment Division

BALDWIN-LIMA-HAMILTON CORPORATION
Construction Equipment Division
LIMA, OHIO, U.S.A.

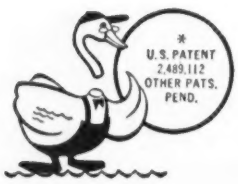


Shown here is a Talbert Beam Deck Trailer, Model T3BD-75-RG-RA with a Talbert Single Axle Dolly loading a Marion, Model 93M. This rig is owned by W. H. Hinman, Inc., of North Anson, Maine.

SIMPLE LOADING OPERATION

...the TALBERT way

Talbert Trailers are designed so as to permit loads of this type to be hauled on the job. The empty weight has been held to a minimum, permitting the contractor to haul up to a yard and half machine legally in the State of Maine.



Write for new Talbert Catalog No. 104.

THE TALBERT CONSTRUCTION EQUIPMENT CO., of Lyons, Illinois manufactures a complete line of low-bed trailers and dump semi-trailers

THE TALBERT-WAY IS THE EASY WAY

SHOULDER SCRAPER

. . . Continued from page 152

estimated that a unit made of new parts would cost $375. Comparative production studies covering this machine and hand methods indicate that the power scraper removes approximately eight times the material for a given cost.

The removal unit, which was developed with the approval of the property control division, consists of a double-acting hydraulic cylinder mounted on slides which are attached to a 7-ft long H-beam which slides back and forth on a stationary I-beam attached to the front end of an FWD truck. The horizontal throw or movement of the I-beam is 5 ft, and pressure to activate the cylinder is obtained from one of the hydraulic cylinders at the rear of the truck cab, normally used for raising and lowering the wing plow attachments.

Two moldboard scraper attachments are used to remove the berm. A 4-ft long moldboard with scraper edge is attached to and mounted at an angle with the H-beam and is used for blading winter sand and dirt accumulation on the shoulder. This operation deposits the material in a windrow under the guide rail cable. The next operation brings into play a 5-ft moldboard with scraper edge which is mounted at right angles to the H-beam. This is used to cut the berm and cast it down the embankment.

The area disturbed by the removal of the berm is oiled as a final stabilizing operation and also to prevent future vegetative growth directly beneath the guide rail.

The idea of using a four-wheel-drive truck for the motive power was conceived by J. J. Blaney, equipment inspector, and Steve Choma, who displayed considerable mechanical ingenuity in assembling the equipment using salvage, scrap and obsolete materials.

What bulk materials do you handle?

Versatile FARQUHAR Trough Conveyors will move it faster with less labor!

Frank Casilio & Sons, a concrete block company in Bethlehem, Pa., moves aggregates from hopper-bottom cars to storage bins, with the aid of this Farquhar Conveyor and Car Unloader.

A mid-west firm finds its Farquhar Conveyor, with the Farquhar Car Unloader, makes short work of unloading phosphate from cars to storage piles.

AGGREGATES, dirt, coal, chemicals, wet cement—Farquhar moves them all, saving you manpower and time. Farquhar Trough Conveyors are dependable, engineered to move material efficiently and to give you trouble-free service for years. Their low feed end makes them perfect for unloading hopper bottom cars, in combination with Farquhar Car Unloaders. Where loading is done by hand, the low feed end permits scraping of material to the carrying belt. If you handle *any* bulk material, Farquhar Trough Conveyors can save you money by saving you time and labor . . . and pay for themselves in a short time.

Whether you move coal, gravel, sand, aggregates, cartons, boxes, bundles, bales, or any kind of bulk or packaged materials—horizontally or from floor to floor—Farquhar can cut your handling costs to rock bottom! One or more of the complete line of Farquhar portable, semi-permanent power-belt or gravity conveyors will solve your handling problems. Our engineers will be glad to consult with you . . . at no obligation!

OLIVER

Farquhar CONVEYORS

POWER-BELT AND GRAVITY CONVEYORS

FREE! "Owners Report"—a booklet of case histories of money-saving conveyor installations.

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THE OLIVER CORPORATION
A. B. FARQUHAR DIVISION
Conveyor Dept. S-26, York, Pa.

Gentlemen
Please send me my free copy of "Owners Report."

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Fast, Low Cost Controlled Concrete Curing With

SERVICISED
CURING COMPOUNDS

- Provide lowest unit of moisture loss
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- Stay put on vertical surfaces—won't run leaving bare, untreated areas

4 TYPES:

1. PIGMENTED — Gray and white

2. CLEAR — Wax-resin base and resin base types.

3. SEPARATION (Anti-Bond) — For "Tilt-up" and Pre-Cast Concrete construction

4. BLACK

Servicised Concrete Curing Compounds offer the contractor many time, material and labor saving features in controlled concrete curing. Write for the new, illustrated circular describing the complete line of Servicised Concrete Curing Compounds.

SERVICISED PRODUCTS CORP.
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WELLMAN *Williams Type*

MORE YARDAGE PER DAY

● Elimination of excess materials and careful weight distribution permit rapid, rhythmic operation of Wellman Dragline Buckets. Operators can cover a wider digging radius with this streamlined bucket.

Built of special alloy steel, using strong welded design, Wellman buckets provide strength and stamina for long-term economy. Perforated designs also available. You'll do better with Wellman.

Want Facts?

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THE WELLMAN ENGINEERING COMPANY
7000 Central Avenue • Cleveland 4, Ohio

DRAGLINE, CLAMSHELL, CUSTOM-BUILT BUCKETS • STONE AND WOOD GRABS

Compact Subbase With Sand Piles

PILEDRIVING for an unusual purpose recently was completed by Western Foundation Corp., New York, at Blythe, Calif., as part of the expansion program for the California section of the Texas pipeline. The project is a new compressor building.

The site is over the top of loose fine sands and engineers figured that, unless some preventive measures were taken during construction, eventual compaction of the sands from vibration of the compressors would cause settlement of the new plant. It was decided to compact the sands before construction of the building—by placing sand piles and erecting the structure over them. In the meantime, vibration and displacement from driving the piles would densify existing sands.

Piles made of compacted sand are 16 in. in dia, vary from 20 to 40 ft in length. A total of 984 piles was driven, on a 4x5-ft spacing for the 208x80-ft site. Compacted sand limits were extended beyond the building dimensions so that piledriving for future extensions will not affect the structure.

Driving procedure was as follows:

Using a No. 0 hammer, a 16-in. dia steel casing with a concrete plug at the bottom was driven into the ground. Inside the casing was a core with a closure plate at the lower end which fits snugly into the casing. Casing and core were driven to required depth and resistance, the core removed and the casing filled with sand.

The core then was placed on top of the sand and the casing extracted by a system of lines pulling over top of the core. Western Foundation uses a line-reeving system which forces the core down at a rate compensating for the upward movement of the casing. As the casing is withdrawn, sand is forced out the bottom, completely filling the volume displaced in driving the casing.

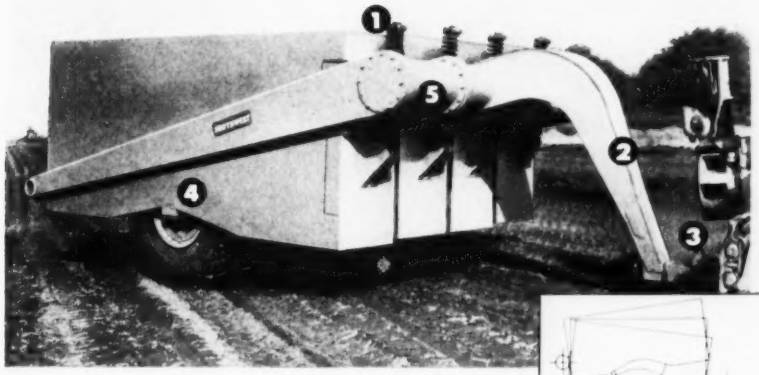
Plans for this method of compaction were developed by Stone & Webster Engineering Corp. Standard piledriving equipment and modified procedures to insure proper placing of the sand were developed by Western Foundation.

STUDY AND COMPARE THESE

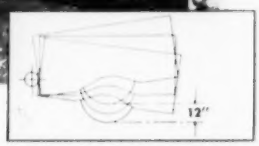
Southwest FEATURES

COMPACTION ROLLER

1. Greater wheel oscillating freedom with each wheel mounted in independent weight box unit.
2. Heavy duty, reinforced gooseneck and sectionalized hauling yoke.
3. Swivel hitch with Timken roller thrust bearing.
4. Each wheel equipped with two large Timken bearings.
5. Sectionalized hauling yoke permits use of 3 to 6 wheel units.



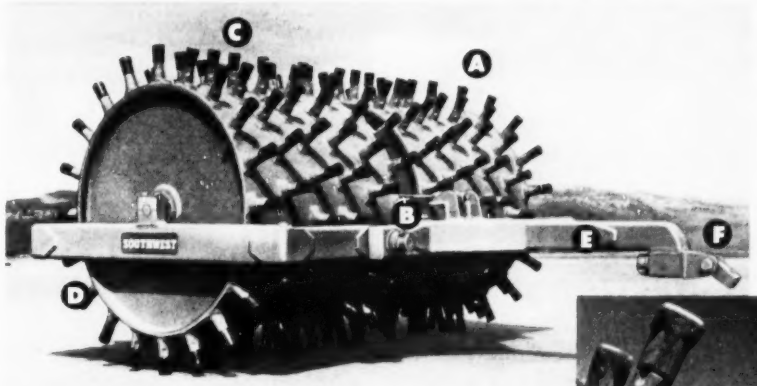
Compaction roller



Closely spaced wheels oscillate independently and each wheel has an up and down movement of 12 inches.

TAMPING ROLLER

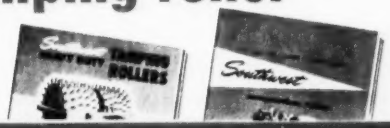
- A. Full oscillating double drums.
- B. Timken roller thrust bearing at oscillating pins.
- C. Two-piece foot with replaceable tips—permits changing size or replacing tip in the field without welding.
- D. One-inch steel drum shell.
- E. Heavy duty, reinforced box steel frame.
- F. Large swivel hitch with Timken roller thrust bearing.



Tamping roller

Simply drive off the old tips and drive on the new tips on the job—no welding required.

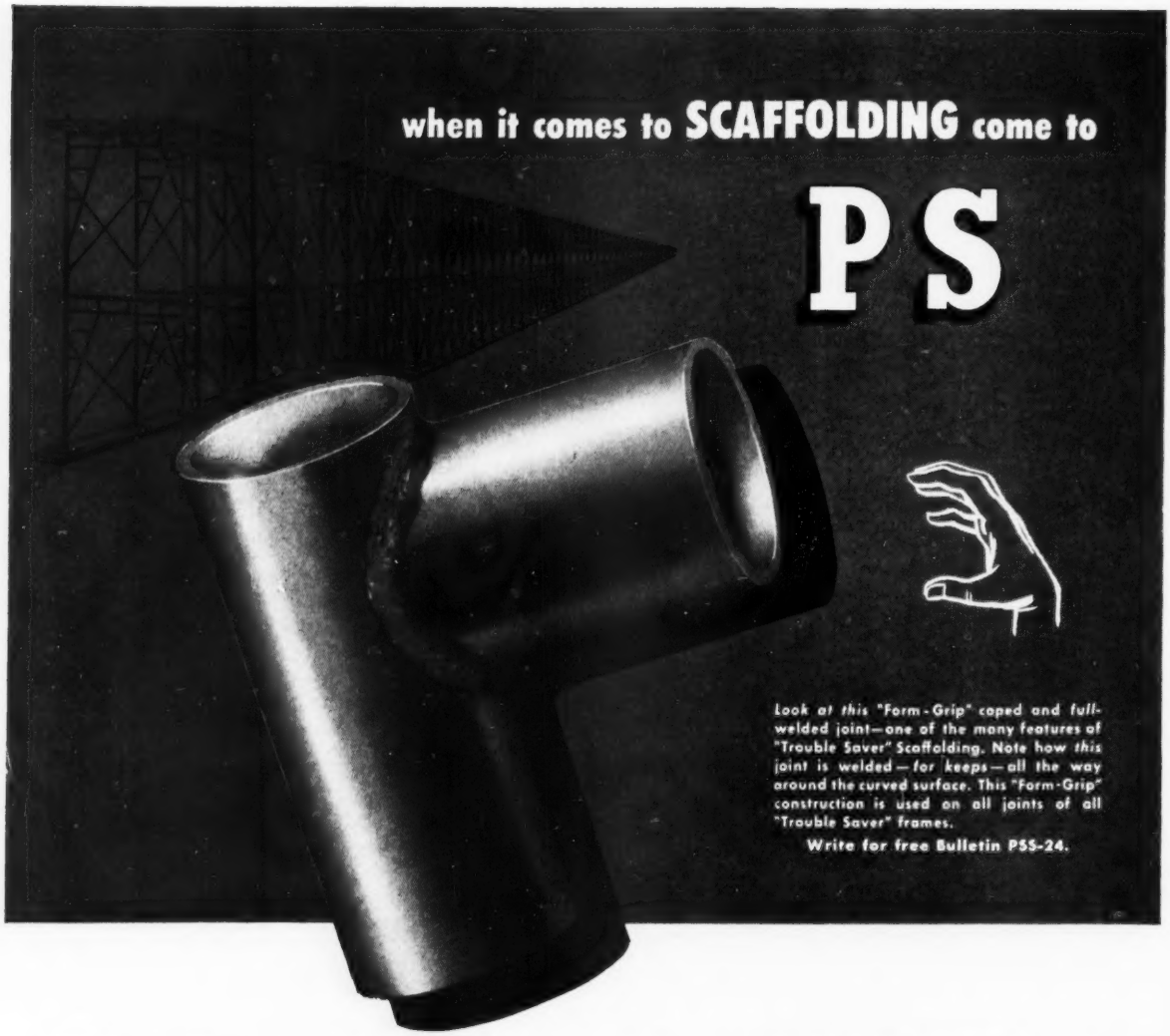
WRITE TODAY for illustrated folders giving complete data and specifications.



Southwest Welding & Manufacturing Co.
CONSTRUCTION MACHINERY DIVISION
ALHAMBRA, CALIFORNIA

when it comes to **SCAFFOLDING** come to

PS



Look at this "Form-Grip" caped and full-welded joint—one of the many features of "Trouble Saver" Scaffolding. Note how this joint is welded—for keeps—all the way around the curved surface. This "Form-Grip" construction is used on all joints of all "Trouble Saver" frames.

Write for free Bulletin PSS-24.

This "Form-Grip" Joint makes "TROUBLE SAVER"® Sectional Scaffolding longer lasting and safer!

"Trouble Saver" Sectional Scaffolding will save you money! That's not just wishful thinking on our part. It's a fact that has been proved on thousands of jobs — large and small! Ask any contractor who has rented or bought "Trouble Saver"; he'll tell you the same! Here's the scaffolding that's quick and easy to put up and take down — that's safe because it's stronger — that saves money by saving time! Approved by Underwriters' Laboratories Inc.

And remember, "Trouble Saver" Scaffolding, which we distribute, is *just one* of the many types of scaffolding offered by PS — types for every kind and size of job. Be sure of the *right* equipment for *your* jobs — *when it comes to scaffolding, come to PS.*

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THE PATENT SCAFFOLDING CO. INC.

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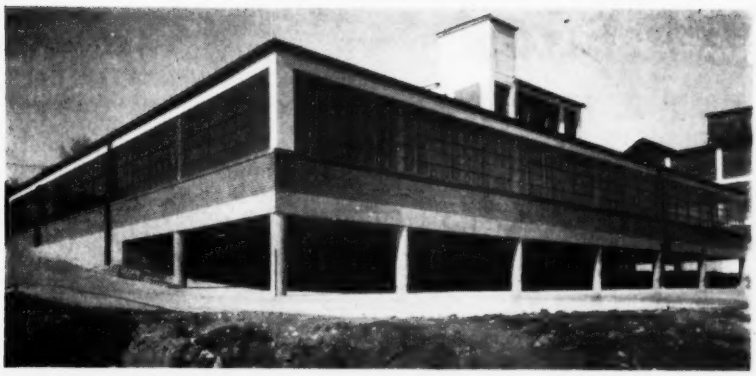
Buy it... or Rent it!

PS offers, *nationally*, a complete engineering service available *locally*. See the "yellow pages" of your 'phone book for the nearest PS Co. office or representative handling "Gold Medal" Scaffolds.



From Start to Finish...
... 30 Days, 176 Working Hours

FACED WITH the all too familiar problem of providing 12,000 sq ft of additional warehousing space in a hurry, the Alligator Co. of St. Louis, Mo., manufacturers, contacted general contractor, Murch-Jarvis Construction Co. for quick action. They got it! The 120x100-ft building they so desperately needed became a reality in just 176 working hours!

Building plans and specs were submitted to the building commissioner in St. Louis on February 27, and a permit was issued the same day. By mid-afternoon, construction supervisory personnel were at the job-site and the building was staked out. One month later, March 27, the Alligator Co. took possession of the completed building. Discounting Saturdays and Sundays not worked, 22 working days had elapsed or, in the parlance of the timekeeper's records, only 176 hr were required to build this fireproof, masonry reinforced-concrete building from the ground up. As can be seen in the photo, concrete piers and concrete foundations support a reinforced concrete floor slab, walls are of brick masonry with steel sash, and the structural framing of steel columns and bar joists support an all-steel roof deck supplemented with insulation and a conventionally applied composition roof.

In reviewing the highly satisfactory performance schedule of the project, the Murch-Jarvis Construction Co. attributed the speedy and successful completion of the building to the following factors:

1. The owner permitted the general contractor to control the project from start to finish. This permitted the contractor to design and specify a type of construction adaptable to quick, economical construction procedures. Materials specified were selected from those immediately available in the St. Louis area. By maintaining complete control and scheduling, all subcontracts and purchasing for

A New Sensation from waqner

the WSD SWING DIGGER

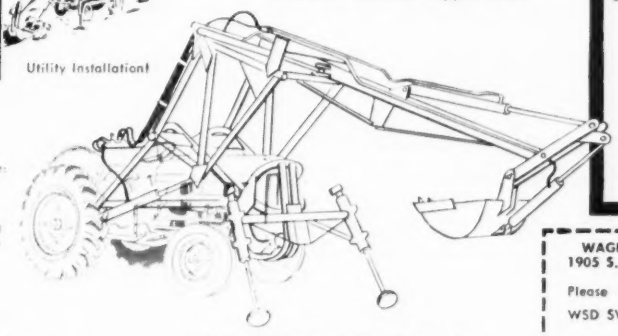
This new WAGNER exclusive . . . the tractor mounted, front end SWING DIGGER . . . already has won the acclaim of contractors, plumbers, utilities and municipalities. Selling for 30% less than units designed to do the same work, the WAGNER SWING DIGGER has added versatility in that it can be converted to a Heavy Duty Loader by removing the Swing Boom and installing a standard WAGNER Dipper Stick.

Pipe Line Installation!

Digs Septic Tank Holes!

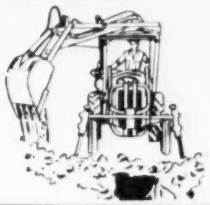
Digs Irrigation Ditches!

Utility Installation!



Other uses include:
Grave Digging
Trench Work
Ditch Cleaning
Nursery Planting
and many others

Swings 8 feet to the right or left from center of hole and digs 8 feet deep.



Lifts to dumping height of over 8 feet for loading into truck.

Currently available for:
Ford, Ferguson, Allis-Chalmers, John Deere, Case, International Harvester, Massey-Harris, Le Roi, Minneapolis-Moline, and Oliver tractors.

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TRACTOR LOADERS
WAGNER IRON WORKS, MILWAUKEE 1, WIS.

WAGNER IRON WORKS, DEPT. CM1
1905 S. 1st St., Milwaukee 1, Wis.

Please send me complete information on a WAGNER WSD SWING DIGGER to fit a.....model .....tractor.

NAME.....
COMPANY.....
ADDRESS.....
CITY..... STATE.....

THE *Best* RULE TO FOLLOW WHEN YOU BUY A MIXER...

Be Sure it's A.G.C. RATED!

11-S MIXER
CERTIFIED
AS BEING IN COMPLIANCE WITH A.G.C. STANDARDS
BY
MIXER MANUFACTURERS BUREAU
GUARANTEED TO HOLD AND PROPERLY MIX 11 CUBIC FEET OF CONCRETE PLUS 10% WHEN OPERATED IN LEVEL POSITION

● AGC RATED pavers and mixers *HAVE* to meet rigid specifications as to sizes and mixing capacity.

That's why Mixer "OUTPUT" is a known quantity when you buy an AGC RATED Mixer.

Protect Yourself—Be Sure the portable concrete Mixer you buy is AGC RATED!

Mixer Manufacturers Bureau

Affiliated with the Associated General Contractors of America, Inc.

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Milwaukee, Wisconsin

CONSTRUCTION MACHINERY CO.
Waterloo, Iowa

THE FOOTE CO., INC.
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THE JAEGER MACHINE CO.
Columbus, Ohio

THE KNICKERBOCKER CO.
Jackson, Michigan

KOEHRING COMPANY
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KWIK-MIX COMPANY
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THE T. L. SMITH COMPANY
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WORTHINGTON CORPORATION
Construction Equipment Division
Plainfield, New Jersey

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CONCRETE SMOOTHIE Concrete Finisher

LIGHT WEIGHT
Handles big and little jobs easily!

"Handiest item any concrete contractor can own!"

- Powered by 2 h.p. gear-reduction Lawson motor.
- Adaptable to any width. Pictured here with 12 ft. runners
- Easy back and forth motion does beautiful work

All machines guaranteed!
ORDER FROM THIS AD!

$134.00 F. O. B.

Dept. M-1

COLUMBUS STEEL FABRICATING CORP.
COLUMBUS, NEBRASKA

the project were controlled directly by the general contractor.

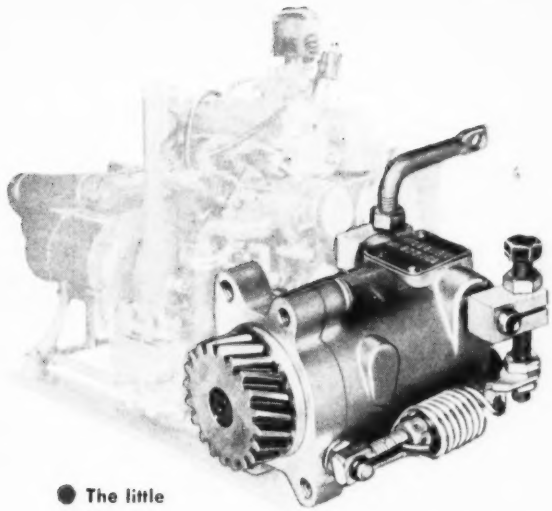
2. A system of close supervision and job liaison between job site and general contractor's purchasing agent and job expediter in the main office paid big dividends in scheduling the job for early completion. According to the contractor, too often elementary foresight is neglected with resultant time loss, as proper materials fail to flow to the job in proper sequence. Too often, also, the subcontractors fail to follow up on one another's heels. On this particular projects, laborers, carpenters, ironworkers, cement finishers, glaziers, bricklayers, sheet-metal workers, painters and roofers moved on and off the job as necessary with time and cost saving facility.

3. By keeping abreast of proved short-cut construction methods, the general contractor can apply these methods at his discretion. In the case of this project, the use of hardboard tubes for pier and column framing and the use of high-early-strength concrete reduced the concrete construction phase to a minimum of time and expense.

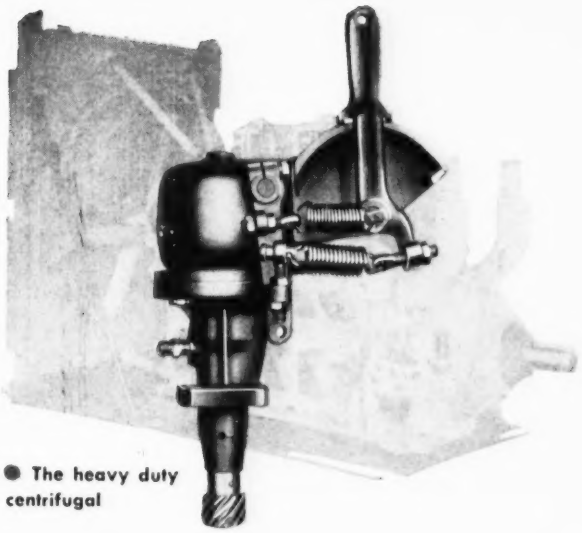
It is interesting to note that the cost of the project was known in advance by the owner, who had a firm contract price before ground was broken. Not only was the project built under the terms of a maximum guaranteed lump contract which included a fixed fee for the general contractor's overhead and profit, but also under the contract terms a saving on total cost was achieved and credited to the owner.

Give Gladly

THE UNITED WAY



● The little 1400 series

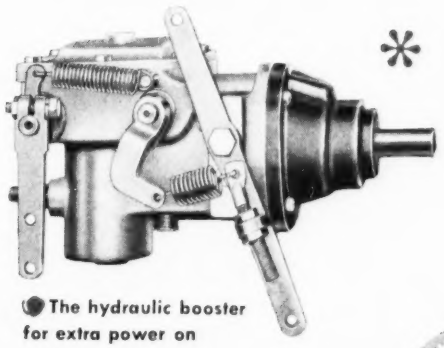


● The heavy duty centrifugal

PIERCE GOVERNORS

preferred for gas (LPG), gasoline and diesel industrial engines... big, medium and small

● The standard long range 900 series



● The hydraulic booster for extra power on racks and valves

Pierce centrifugal governors are your most economical and efficient control mechanisms for industrial engines . . . from small generator sets to monster power units . . . gas (LPG), gasoline or diesel. For engines requiring extra power to position fuel rack or valve, the Pierce centrifugal with hydraulic booster * (for original equipment only) is ideal! Service is locally available . . . your nearby Pierce Service Station is equipped for all types of Pierce Governors.

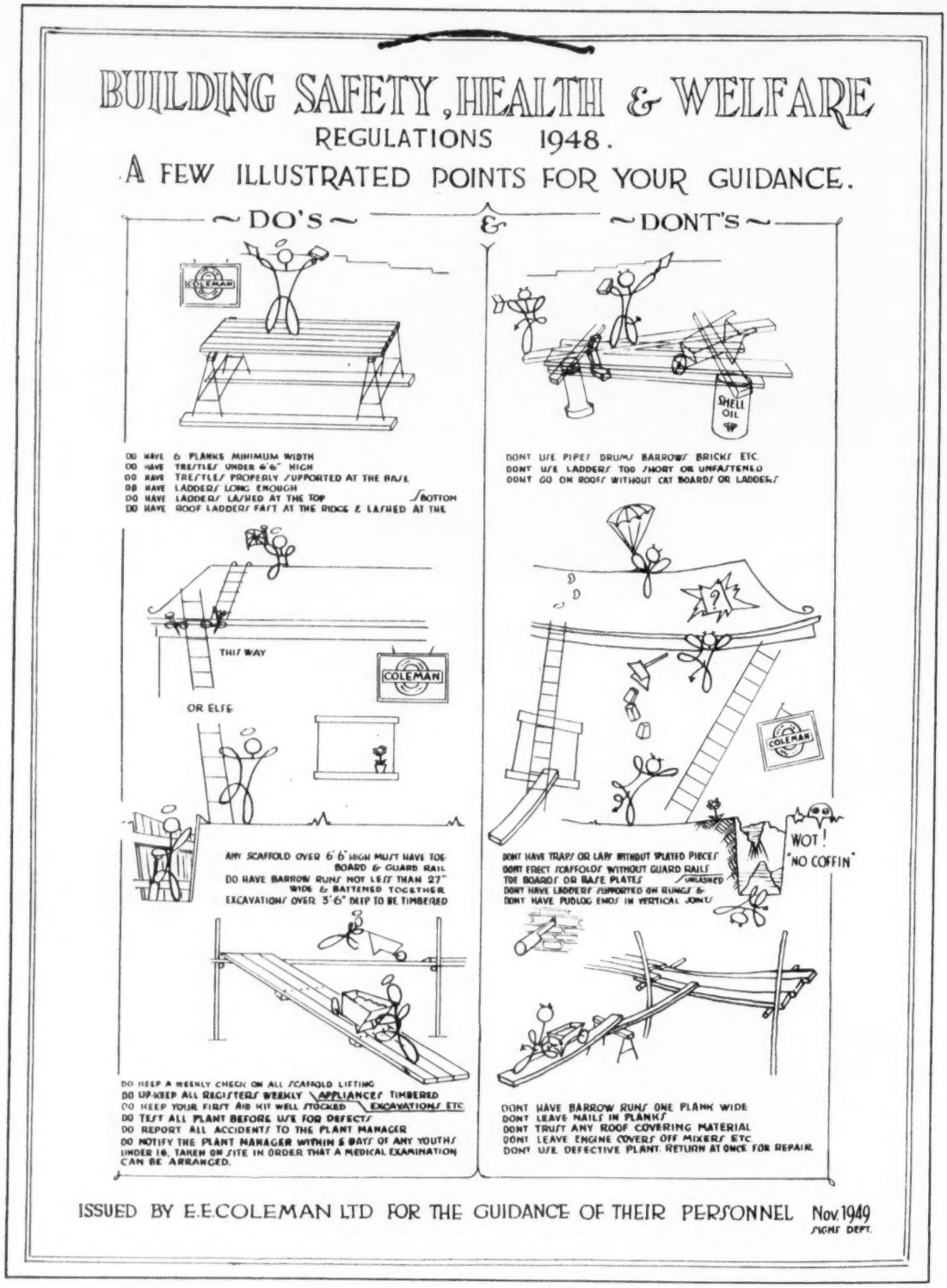
Specify PIERCE Centrifugal governors on your engines . . . for economical, thoroughly dependable control in industrial applications.

PIERCE — THE MARK OF QUALITY

THE PIERCE GOVERNOR CO., INC.

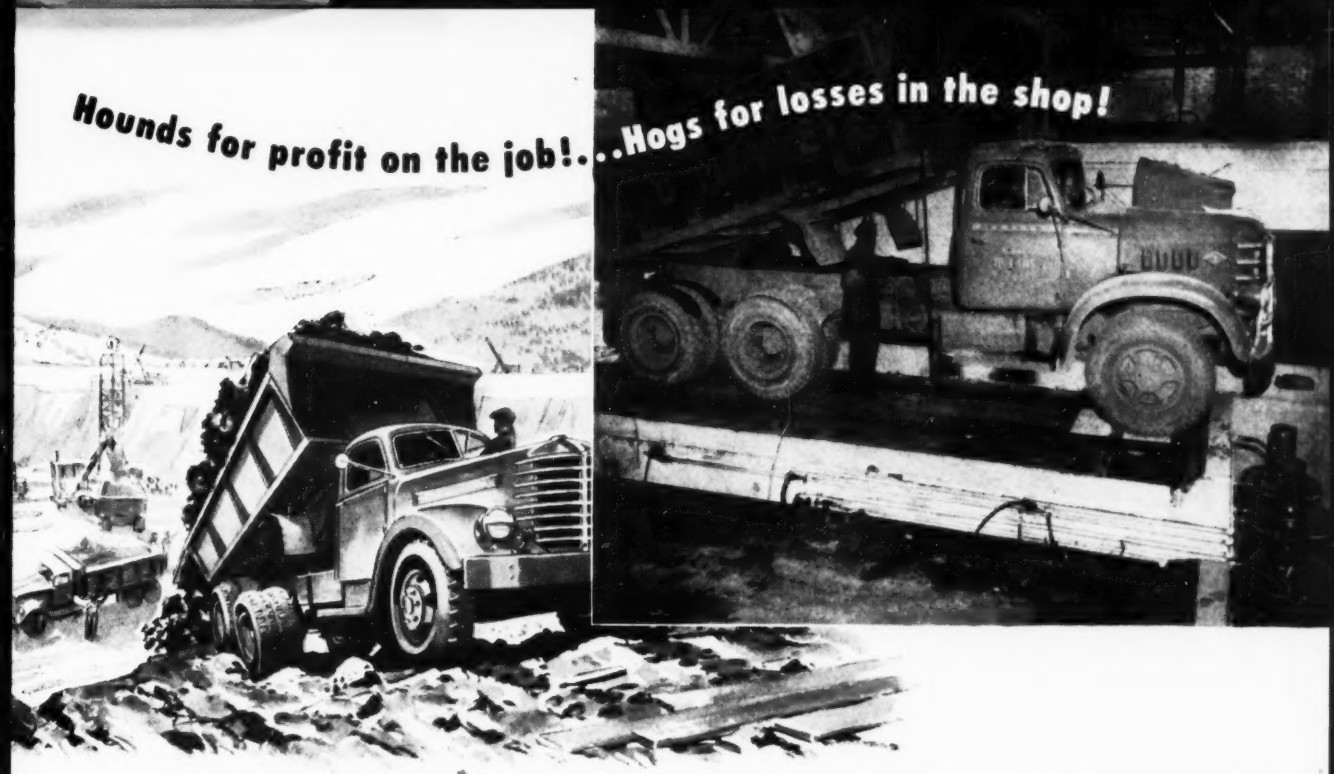
1622 OHIO AVENUE, ANDERSON, INDIANA

"World's Most Experienced Governor Manufacturer"


BUILDING SAFETY, HEALTH & WELFARE
REGULATIONS 1948.
A FEW ILLUSTRATED POINTS FOR YOUR GUIDANCE.
~DO'S~
&
~DONT'S~
COLEMAN
SHELL OIL
DO HAVE 6 PLANKS MINIMUM WIDTH
DO HAVE TRESTLES UNDER 6'6" HIGH
DO HAVE TRESTLES PROPERLY SUPPORTED AT THE BASE
DO HAVE LADDERS LONG ENOUGH
DO HAVE LADDERS LASHED AT THE TOP
DO HAVE ROOF LADDERS FAST AT THE RIDGE & LASHED AT THE BOTTOM
DONT USE PIPES DRUMS BARROWS BRICKS ETC
DONT USE LADDERS TOO SHORT OR UNFASTENED
DONT GO ON ROOFS WITHOUT CAT BOARDS OR LADDERS
THIS WAY
OR ELSE
COLEMAN
ANY SCAFFOLD OVER 6'6" HIGH MUST HAVE TOE BOARD & GUARD RAIL
DO HAVE BARROW RUNS NOT LESS THAN 27" WIDE & BATTENED TOGETHER
EXCAVATIONS OVER 3'6" DEEP TO BE TIMBERED
DONT HAVE TRAPS OR LADY WITHOUT SLATED PIECES
DONT ERECT SCAFFOLDS WITHOUT GUARD RAILS TOE BOARDS OR BASE PLATES UNLASHED
DONT HAVE LADDERS SUPPORTED ON RUNGS &
DONT HAVE PUDLOG ENDS IN VERTICAL JOINTS
WOT! "NO COFFIN"
DO KEEP A WEEKLY CHECK ON ALL SCAFFOLD LIFTING
DO UP-KEEP ALL REGISTERS WEEKLY APPLIANCES TIMBERED
DO KEEP YOUR FIRST AID KIT WELL STOCKED EXCAVATIONS ETC
DO TEST ALL PLANT BEFORE USE FOR DEFECTS
DO REPORT ALL ACCIDENTS TO THE PLANT MANAGER
DO NOTIFY THE PLANT MANAGER WITHIN 6 DAYS OF ANY YOUTHS UNDER 18, TAKEN ON SITE IN ORDER THAT A MEDICAL EXAMINATION CAN BE ARRANGED.
DONT HAVE BARROW RUNS ONE PLANK WIDE
DONT LEAVE NAILS IN PLANKS
DONT TRUST ANY ROOF COVERING MATERIAL
DONT LEAVE ENGINE COVERS OFF MIXERS ETC
DONT USE DEFECTIVE PLANT. RETURN AT ONCE FOR REPAIR.
ISSUED BY E.E.COLEMAN LTD FOR THE GUIDANCE OF THEIR PERSONNEL Nov 1949
SIGNS DEPT.

Selling Safety in England

Construction Methods and Equipment is read regularly in lands across the seas, and readers often tell us how they do things in other countries. Reproduced above is an amusing but effective safety poster used by E. E. Coleman, Ltd., builders and contractors of Manchester, England. They tell us that the cartoon technique brings good results.



Alemite "Friction Fighters"

speed lubrication of Edmier trucks in the shop ...save hours on the job!

Time is money when these big babies lie around the shop—and even more costly is a needless breakdown in the field. Avoid both kinds of expensive down-time by getting rid of out-of-date lubrication methods.

That's what the Edmier Company of Chicago did when they installed time-saving Alemite equipment in the central shop. Keeping a fleet of 155 dump trucks, tractors, graders, loaders and motorized equipment on the job is no cinch. But with thorough Alemite lubrication a *must* on every work sheet—down-time is slashed to the bone!

Edmier, like countless other successful construction firms, found that with Alemite "Friction Fighters" on the job, they save THREE ways!

1. Save Time! Equipment is in and out in a hurry, efficiently protected, back on the job.

2. Save Money! By cutting lubrication down-time you increase output of *both* men and machines—slashing operating costs!

3. Save Equipment! By greatly reducing the chance of bearing failure—by keeping rigs running longer.

On the toughest jobs . . . Alemite lubrication protects expensive equipment, even where grit and dirt threaten bearings at every turn. Whatever your lubrication problem there is Alemite lubrication equipment to meet it. Write today. Find out how Alemite "Friction Fighters" can save your time—money—and machines!

for high pressure lubrication anywhere in the shop . . .

takes lubrication right to the machine!

This portable, high-pressure lubricator develops up to 5,000 lbs. pressure. Exclusive construction provides positive delivery even with heaviest greases. Large rubber-tired wheels plus compact design make it highly maneuverable. Travels easily over rough floors and into cramped areas. 40 lbs. capacity, serves many bearings without refilling. It's Alemite Model 6288, "Rockcrusher."

ALEMITE, Dept. Dept. F-93
1850 Diversey Parkway, Chicago 14, Illinois

Gentlemen:
Please send me your illustrated booklet containing complete information on Alemite equipment.

Name .....

Company .....

Address .....

City ..... State .....

ALEMITE

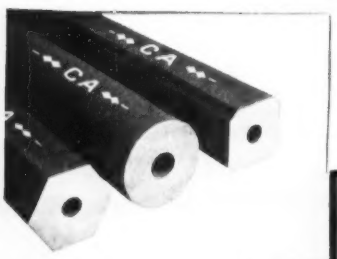
A PRODUCT OF SW STEWART WARNER

they're using
CRUCIBLE HOLLOW DRILL RODS
on the Delaware Aqueduct

CRUCIBLE HOLLOW DRILL RODS are helping construction crews to complete the vast network of dams and tunnels being built to increase New York City's water supply. When finished, water from the Pepacton, Neversink and Rondout Reservoirs, which will be impounded by a trio of earth-fill dams, will be conducted to New York through the 85-mile-long Delaware Aqueduct.

In rock drilling operations for the dams, effluent chambers and connecting tunnels, Crucible Hollow Drill Rods have proved their ability to outperform other types . . . to withstand the severest punishment with minimum breakage and bit loss.

That's because Crucible Hollow Drill Rods are made to tool steel specifications by the nation's leading producer of tool and other special purpose steels. These high quality drill rods have greater fatigue strength – you can count on lower cost per foot of hole in hard rock drilling. Next time you have a drilling job, be sure you order Crucible Hollow Drill Rods.



CRUCIBLE first name in special purpose steels

53 years of Fine steelmaking

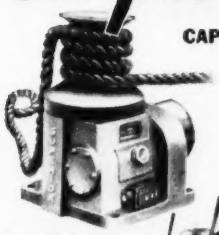
HOLLOW DRILL ROD

CRUCIBLE STEEL COMPANY OF AMERICA, GENERAL SALES OFFICES, OLIVER BUILDING, PITTSBURGH, PA.

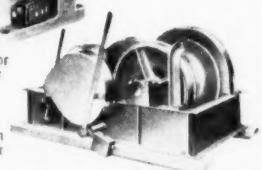
REX HIGH SPEED • TOOL • REZISTAL STAINLESS • ALLOY • MAX-EL MACHINERY • SPECIAL PURPOSE STEELS

"Superior" Electric

Carpullers



CAPSTAN TYPE, DRUM TYPE AND SPECIAL TYPES



Model SC Superior Capstan Carpuller

Model EP Drum Type Carpuller

One man can move hundreds of tons of rolling load with practically no effort. Economical, efficient, Carpullers are available for your specialized requirements.

Write for bulletins and catalogs!

Designed and Manufactured by

SUPERIOR-LIDGERWOOD-MUNDY CORPORATION

Main Office and Works: SUPERIOR, WISCONSIN, U. S. A.
New York Office, 7 Dey Street, New York 7, N. Y.

Need Holes In Concrete?

GET 50% MORE HOLES WITH TERMITE DRILLS!

Penetrate toughest concrete with less pressure and with less drill wear . . . with TERMITE DRILLS. Pulverizing action eliminates objectionable noise. Exclusive construction gives you cleaner, more accurate holes in less time and at less cost. Use with standard electric drills or air motors.

Free Factory Resharpening

Write for FREE literature and prices

TERMITE DRILLS

Lengths up to 36". Standard diameters from 3/16" to 5". Other diameters up to 8" on special order.

TERMITE DRILLS, INC.
85 N. Lotus Ave., Pasadena 8, California

YOUR SAFETY GUARD: KEEP IT UP!

Now a New Construction Hazard

CONTRACTORS AND EMPLOYEES have their hands full keeping accidents down to a minimum on any job, but when a moose causes one . . . well, that's one for the books.

Such an accident, a serious one, too, did happen recently up Alaska way. A moose became entangled in some electrical wires, so an employee volunteered to climb up and cut the wires. The moose when freed showed his appreciation by charging the employee who freed him. The employee ran about 15 ft, stumbled and fell at the edge of a cliff. The moose almost cleared the man but evidently caught him with his hind feet. Both moose and man fell approximately 60 ft to a road below. The employee was critically injured. What about the moose? In this case "No moose would be good moose." Ouch!

The End of Time

IT TAKES . . .
One minute to write a safety rule.
One hour to hold a safety meeting.
One week to plan a safety program.
One month to put it into operation.
One year to win a safety award.
One lifetime to make a safe worker.

BUT IT TAKES . . .
Only one second to destroy *it all* with an *accident!*

Don't You Believe This!

PHONY NOTIONS OR BELIEFS that people hold as truths or use an excuse can be the cause that leads to an accident. For instance, haven't you heard this one? "I had this accident because the law of averages caught up with me." You are the one responsible for your averages. You can repeal the law of averages by not taking any chances.

Or how about this one: "Nothing can happen to me till my number comes up." Then it happens. Check back. Your number was not up . . . most likely you took a chance and courted disaster.

Then there are those who scoff

(Continued on page 168)

ALL NEW FASTER SHORE

1. EXTEND TO WITHIN 1" WITH PIN
2. SCREW 1-3 TURNS TO TIGHTEN AND IT'S ALL SET

3 different heads for all jobs

3 sizes 6'-11', 8'-13', 10'6"-15'6"
All shores have 5' adjustment range

Built-in nailing plates for fast, easy bracing in either direction

Easily set and adjusted by one man

Heavy duty, high carbon steel

Made by the manufacturers of Waco Steel Scaffolding

WRITE TODAY
FOR FREE INFORMATION

WACO Manufacturing Company

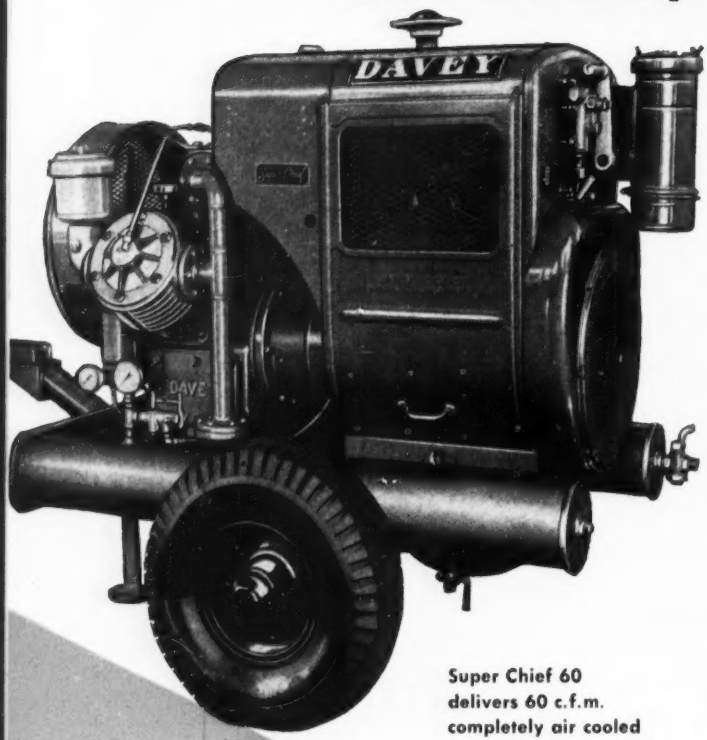
3560 Wooddale Ave.
Minneapolis 16, Minnesota

Canada
Armson Iron Works
Windsor, Ontario

West Coast
Waco-May Co.
Los Angeles, Calif

DAVEY *Super Chief*

. . . the lightweight champion with the heavy-duty work punch!



Super Chief 60 delivers 60 c.f.m. completely air cooled (engine and compressor)

There are more 1951-'52-'53 Davey Super Chief 60s in service today than any other 60 c.f.m. compressor built in the same years.

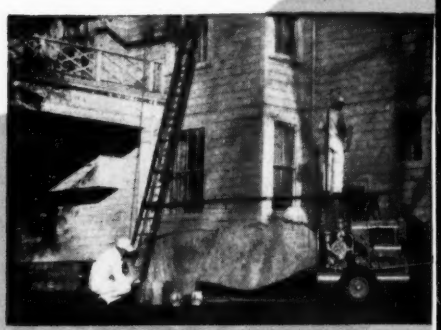
The reason—here is the world's finest, economically-priced 1250 lb. compressor designed for heavy-duty service. Features include automatic controls, clutch between engine and compressor, full force feed lubrication, built-in unloader system, air receiver integral with frame . . . highest speed spring-mounted chassis and tow bar ever placed on a compressor. Super Chiefs can be towed behind any truck or passenger car . . . easily moved by one man.

Like the famous bigger Daveys, the Super Chief 60 has *Permanent Peak Efficiency Valves.* These never carbon or foul. They guarantee the utmost in operating satisfaction, low cost operation, long life.

A-1900

▲ . . . ideal for maintenance and repair.

▼ . . . perfect for sewer and plumbing jobs.



▲ . . . for spray painting and 1,000 plus one big and little operations.

DAVEY

pioneers of air-cooled air

Davey manufactures portable and industrial compressors of 60, 105, 160, 210, 315, 500 and 600 c.f.m. capacities; "Auto-Air" truck-mounted compressors; Mobile Machine Shops and Field Service Units.

DAVEY COMPRESSOR CO. • KENT, OHIO

Kentucky put the emphasis on flexibility when it designed this highway

Like other large cities, Louisville, Ky. has found it more and more difficult to cope with the traffic problem. To help relieve this situation, the Kentucky State Highway Department is constructing what is known as the Inner-Belt Highway, over which traffic entering Louisville from the east and south by-passes the heart of the city.

The most notable feature of this project was Kentucky's choice of a flexible type of construction from top to bottom. It consists of a 9-inch subbase of waterbound macadam, covered by a 3-inch base of hot-mix Texaco Asphaltic Concrete. To complete the highway, a Texaco Asphaltic Concrete pavement was laid in two courses, each 1½-inches thick. The result is a total thickness of 15 inches of completely flexible construction, which is capable of absorbing heaviest traffic impact year after year with a minimum of maintenance.

Texaco Asphalt Cements, Cutback Asphalts and Slow-curing Asphaltic Oils offer the road builder a wide choice of improvements for his street or highway. Whether the volume of traffic calls for a heavy-duty pavement like that on Louisville's Inner-Belt Highway, a low-cost surface for a secondary road, or an inexpensive mat to eliminate dust and mud, there is a Texaco Asphalt product to fit the need. Helpful information for the road builder on all these types is supplied in two booklets, which our nearest office will be glad to send you.

Refined from scientifically selected crudes, Texaco Asphalt products have earned and held the confidence of America's road builders for 50 years.

Constructing one of three courses of resilient, heavy-duty Texaco Asphaltic Concrete over a waterbound macadam subbase on Louisville's new Inner-Belt Highway. The contractor was the Breslin Construction Company of Louisville.

THE TEXAS COMPANY, Asphalt Sales Dept., 135 E. 42nd Street, New York City 17

Boston 16 • Chicago 4 • Denver 1 • Houston 1 • Jacksonville 2 • Minneapolis 3 • Philadelphia 2 • Richmond 19

TEXACO

TEXACO ASPHALT

(Advertisement)

PROPER VIBRATION AND GOOD FORMS used in this well-planned box girder intersection make it easy to produce the best possible concrete. Good vibration technique is simple with good equipment, and . . .

Vibration Know-How Produces Better Concrete the Easy Way

One of the many ways experienced concrete foremen get maximum benefit from vibration is by planning concrete placement so each new dump is backed into a previous dump. This results in a smooth surface (no rock pockets) with maximum bond and greater strength. In the above photo the workman has just finished vibrating a dump at the center of a box girder intersection. As each succeeding dump is placed he will vibrate from the center outward, working it into concrete previously placed in the side members.

Appearance of sheen on the surface of the concrete gives visual indication that vibration is complete. With the modern high frequency vibrators pioneered by VIBER this requires only about 10 to 30 seconds, depending on the characteristics of the concrete.

• **Vibrator Operators** soon develop a "feel" which tells them the exact condition of concrete during vibration without seeing it. An experienced operator depends on this "feel" and the sound of his vibrator more than on the appearance of the concrete to tell him when vibration is completed.

Experienced operators describe the feel of concrete when the vibrator is first inserted as "rough" and "rocky." In a matter of seconds it "smooths out" and becomes "creamy," at which point vibration is complete and the unit may be removed from the concrete.

• **Good Forming** and proper vibration are essential where finished appearance is important, as it was on this overpass built by Erickson, Phillips, and Weisberg as part of the East Bay Freeway in Oakland, California. Tight forms made of well-seasoned lumber adequately braced can take full advantage of vibration to produce smooth, rock pocket-free concrete. VIBER'S replaceable rubber tipped vibrators are specially designed to prevent any damage to such forms, which might cause blemishes on the finished concrete surface.

• **For The Complete Story** on vibration know-how or further information on VIBER'S complete line of internal and external vibrators, contact your authorized distributor or VIBER COMPANY, 726 South Flower Street, Burbank, California. **Dept. 68.**

KEEP UP YOUR SAFETY GUARD . . .

Continued from page 165

at safety—even refer to it as "sissy stuff." Is a pilot a sissy because he wears a parachute? Is a baseball catcher a sissy because he wears a mask?

It's not brave to be foolish when you can protect yourself against a possible hazard.

Safety is often a state of mind, so don't you believe the phony notion that it takes a miracle to prevent an accident. Miracles are something that don't often happen. Accidents do happen often. Personal safety is something you have to work at every day.

Just Ask the Man Who Owns This One!

THIS LITTLE SAFETY story could probably be summed up in these few words — USED HEAD, WORE HAT, SAVED LIFE. Dave Quackenbush of Star Lake, N. Y., owner of the hat knows that such a safety appliance not only can protect against falling objects, but also can offer protection to the falling object. Dave, a jackhammer operator, recently fell while drilling a large rock. He landed on his head on a pile of rocks below. His hard hat stayed on and the high-strength, one-piece bakelite construction absorbed the impact and dissipated the force of his fall. You can be sure now that Dave doesn't complain about any discomfort from any safety appliances.

Now! A new "break" for the driver

. . . is a "break" for your delivery costs! The world's most comfortable truck cab cuts driver fatigue!

Keeping the driver happy by reducing driver fatigue is not the only virtue of the new Ford Truck DRIVERIZED CAB.

Easier driving, for example, means safer driving! Easier driving means greater efficiency in terms of more trips, more stops, more deliveries per day—which means a more profitable operation.

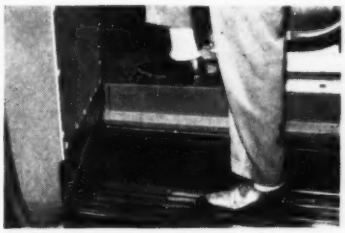
The new Ford Truck DRIVERIZED CAB is just one of many new *time-saving* features that help *get jobs done fast!*

For sustained speed travel, Ford provides new LOW-FRICTION power in V-8 or Six. For faster, easier handling, Ford provides Synchro-Silent transmissions in every model—and new "short-turn" front axles.

Both Standard and Deluxe DRIVERIZED CABS offer all the features mentioned on this page. See your Ford Dealer for full details.

DRIVERIZED DELUXE *cab shown in photos available at slight extra cost.*

SWING *open the new, wider doors!* Door handles are the easy-operating push-button type . . . like you get in quality cars. Door latches are new rotor-type.



HOIST *your size 12's into the cab!* Plenty of room between the seat and door pillar. No need to do a toe dance getting into or out of a Ford "DRIVERIZED CAB!"

SLIDE *into the wide, comfortable seat.* Bounce on it to test the super-cushioning action of Ford's exclusive *seat shock snubber* and new non-sag springs.

SWEEP *your eyes across the new one-piece windshield.* With picture-window visibility like this you can really navigate. Safer driving, of course! Less eye-strain!

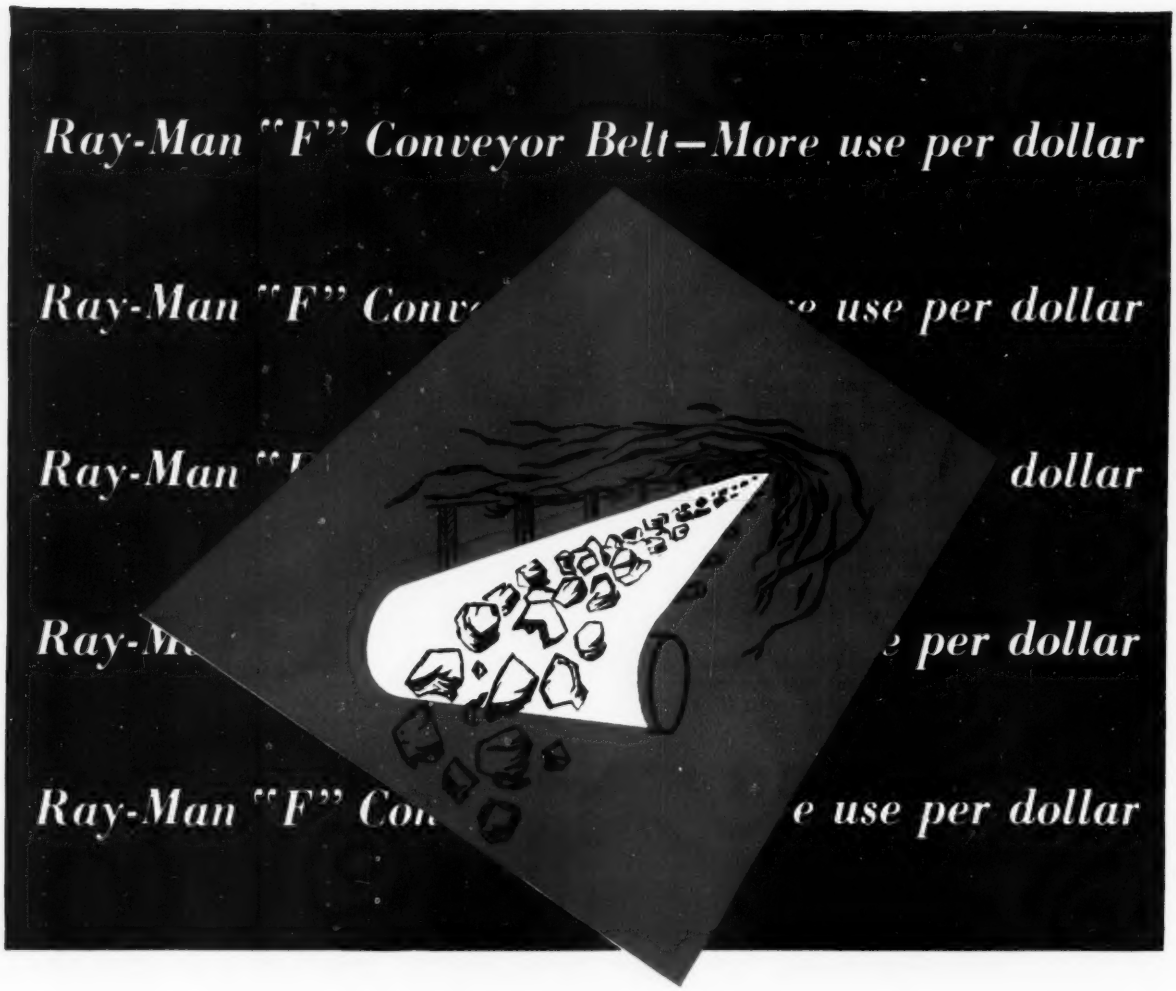
GLANCE *back through the 4-ft. wide rear window.* Heads right or left, you can see the space you're backing into. Why pay extra for rear quarter windows?

STRETCH *your arms into big cab roominess.* With more hip-room than any of the 5 other leading makes, FORD DRIVERIZED CABS banish that "squeezed-in" feeling.

New F-900 BIG JOB has a 27,000-lb. G.V.W. rating for extra heavy hauling work. LOW-FRICTION 155-h.p. Cargo King V-8 offers high sustained torque to give more performance flexibility for your heaviest loads.

FORD
ECONOMY
TRUCKS

SAVE TIME! SAVE MONEY!
LAST LONGER!

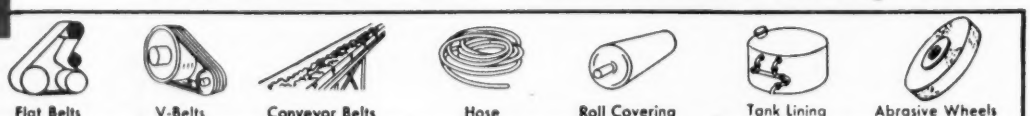


ON ABUSIVE HAULS... Ray-Man "F" will cut costs where your conveyor belts are commonly exposed to tearing or puncturing . . . where pulleys are small . . . where fastener failure is a particular problem. The unique properties of synthetic fiber strength members make possible these advantages. Ray-Man "F" also gives you everything you require in a general purpose belt—flexibility, troughability, impact resilience, ease of training, strong cover adhesion—MORE USE PER DOLLAR. Ask the R/M distributor for Bulletin 6915. Ask him, too, about Homocord, R/M's extra-cushioned conveyor belt for heavy impact loading. R/M field engineers back him up to give you MORE USE PER DOLLAR—not only in conveyor belts, but in hose, transmission and V-belts.

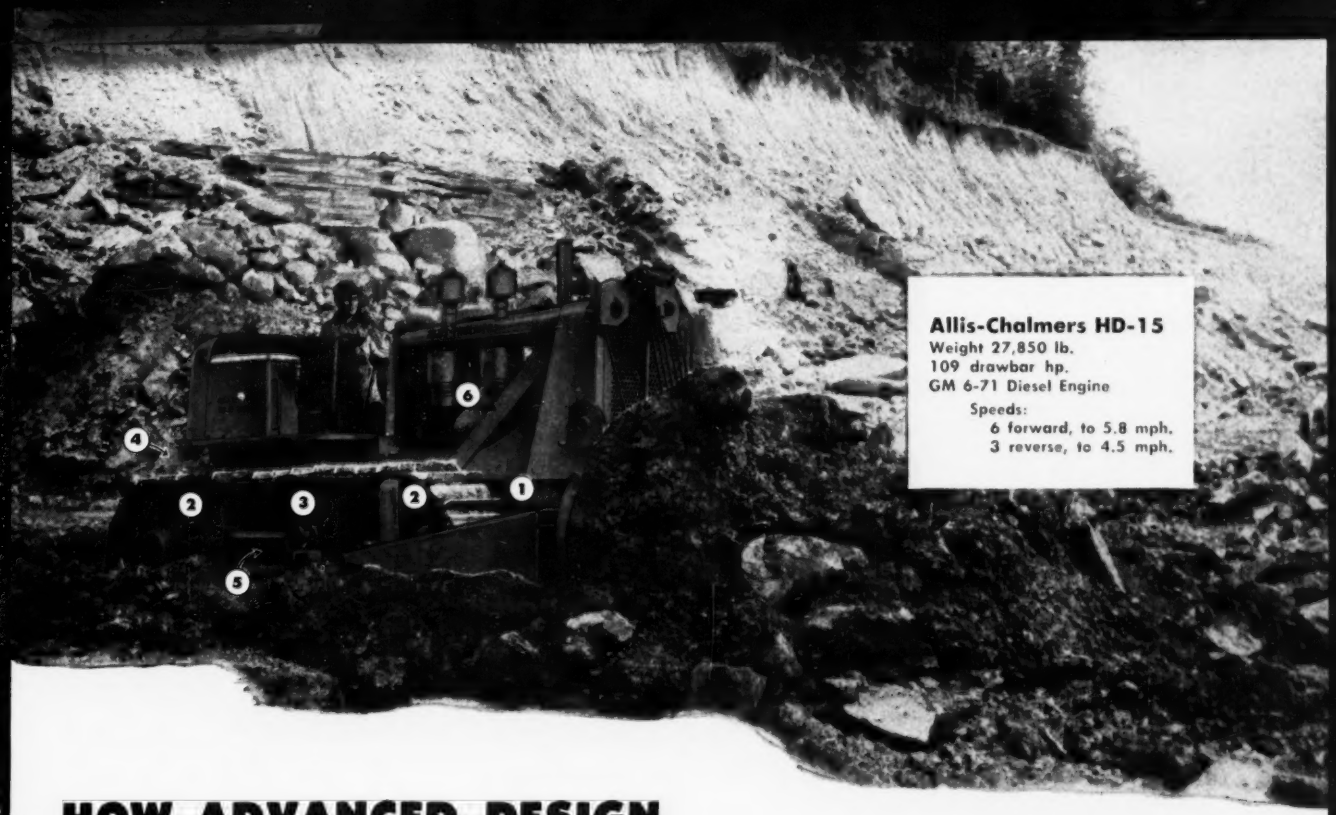
R/M

MANHATTAN RUBBER DIVISION — PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.



Other R/M products include: Industrial Rubber • Fan Belts • Radiator Hose • Packings • Brake Linings • Brake Blocks Clutch Facings • Asbestos Textiles • Sintered Metal Parts • Bowling Balls



HOW ADVANCED DESIGN

Makes Allis-Chalmers Tractors more dependable

These heavy-duty tractors have toughness and ease of servicing to match their outstanding performance ability. Here are some of the advanced design features that provide extra strength and protection — keep Allis-Chalmers tractors on the job more hours:

1. One-Piece, All-Welded Structural Main Frame . . . strong and firm without a single ounce of excess weight — absorbs all vertical and horizontal stresses.

2. Extra Large Idler and Sprocket eliminates rocking action, puts more track on the ground for greater stability and better traction.

3. Spring-Loaded, Positive Seal keeps dirt, moisture and grime from damaging truck wheels, idlers and support rollers . . . you lubricate them only once every 1,000 hours.

4. All-Steel, Welded A-Frame Track Stabilizer permits free track oscillation, yet keeps tracks rigidly in line and absorbs thrusts and twists from shock loads and working on uneven terrain.

5. Oil Enclosed Track Release Mechanism reduces track maintenance and breakage. An adjustable screw lock provides positive holding action that maintains adjustment at required setting.

6. Engine Not Used as Structural Member — no strain is transmitted to it. Engine weighs less per horsepower developed, because of 2-cycle design — has modern unit injection.

UNIT CONSTRUCTION SAVES SERVICE TIME

With Allis-Chalmers *unit construction*, major assemblies are easily removed without disturbing related assemblies. This brings real savings in time and money, puts tractors back to work faster. It assures better inspection and maintenance, too. Servicemen find it easy to remove major parts to correct trouble before damage develops.

Let your dealer tell you more about the toughness of Allis-Chalmers tractors, their time-saving unit construction — and their unequalled lugability and work power.

ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

Dig 'em and fill 'em with CLEVELANDS

The Cleveland "Baby Digger" Model 95 is making short work of cutting trench for a gas main extension under good digging conditions in Minneapolis. Even greater savings were effected by the 95 during severe winter digging conditions.

Here, a Cleveland Model 80 is speedily and cleanly backfilling the trench shown in the top picture. The 80 is also an excellent pipe layer. When job conditions require backfill compaction, the 80 does an outstanding job with no additional men or equipment necessary.

The
CLEVELAND TRENCHER CO.
Pioneer of the Modern Trencher
20100 ST. CLAIR AVENUE • CLEVELAND 17, OHIO

SALES AND ★ SERVICE ★

news of manufacturers activities designed to assist the reader in the purchase of machinery, equipment and materials and help him obtain quick service on parts and maintenance.

Distributor Appointments

Bucyrus-Erie Co.: The following three distributors have been appointed to handle Bucyrus-Erie ⅜- to 4-yd shovels, draglines and cranes in their areas—Euclid Arkansas, Inc., North Little Rock, Ark.; General Equipment, Inc., Baton Rouge, La., and Graze-Dempsey, Inc., Jacksonville, Fla.

Bay Equipment Co.: Two San Francisco Bay area construction firms have been consolidated under the above name. Participants in the merger are Garfield and Co., San Francisco, and Bay Equipment Co., Richmond. The merger adds Garfield's lines of Bay City, Industrial Brownhoist and Plymouth Locomotive equipment to the Bay Equipment selection, which includes Manitowoc, Clyde and Harris.

Doug-Lynn Co., Inc.: Has appointed three distributors in the West for its True-Lay Paver. They are Edward R. Bacon Co., San Francisco; Western Machinery Co., Phoenix; and Smith-Booth-Usher Co., Los Angeles.

Marion Power Shovel Co.: Has announced the appointment of Kern-Limerick, Inc., as Marion distributor in Arkansas. Offices are located at 115 N. Spring St., Little Rock.

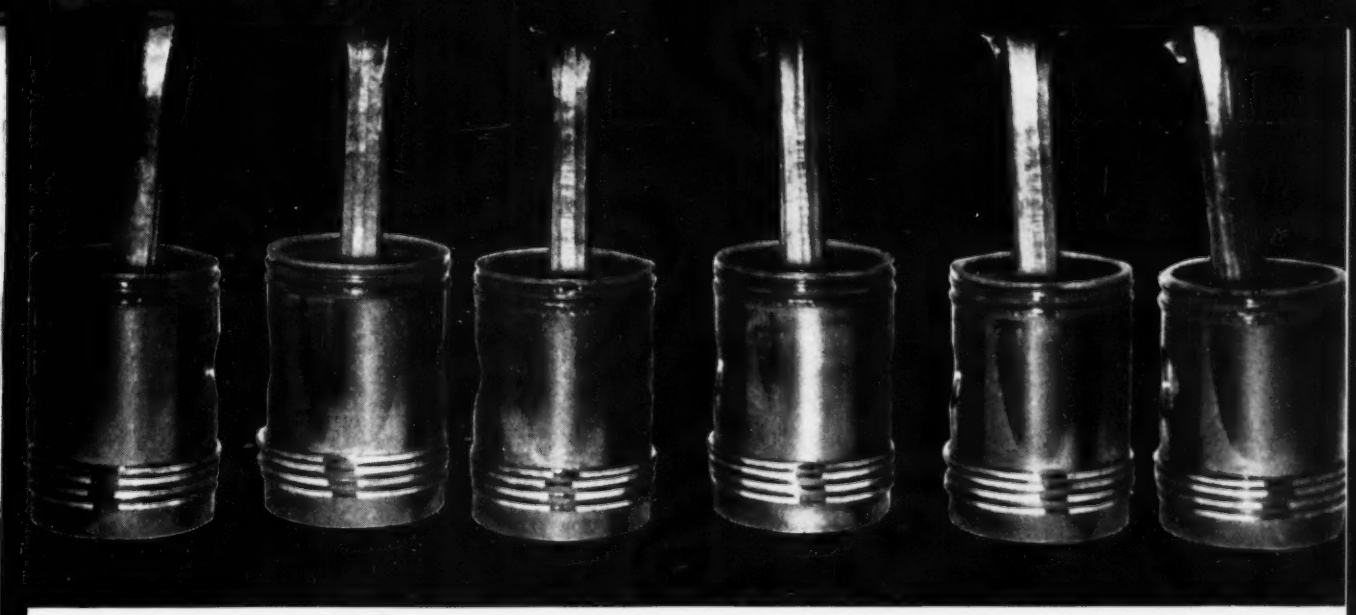
Wooldridge Mfg Co.: Interstate Equipment Co., 131 N. Center St., Statesville, N. C., has been appointed as exclusive dealer for Wooldridge earthmoving equipment throughout North Carolina.

LeTourneau-Westinghouse Co.: Atlantic Tug & Equipment Co. has been appointed to serve contractors in northeastern New York state. Main office of this distributor is at 1801 E. Erie Blvd., Syracuse, N. Y.

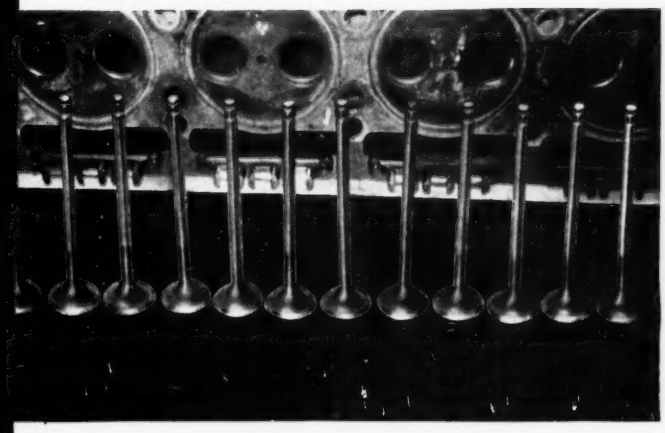
Clayton Mfg. Co.: Appointment of Borchert-Ingersoll, Inc., St. Paul, Minn., as distributors for Clayton steam generators in Minnesota and Douglas County in Wisconsin, has been announced.

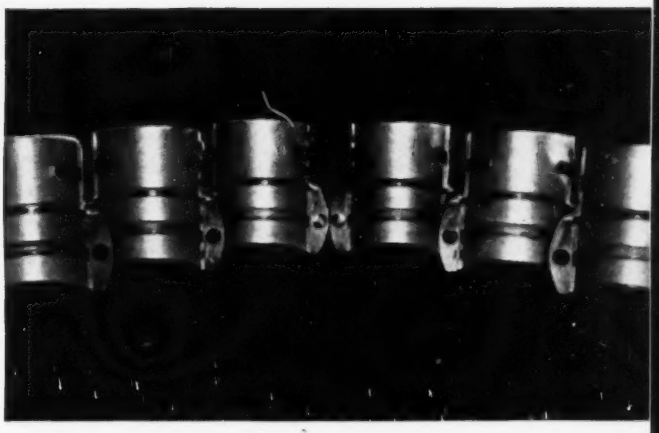
Lippmann Engineering Works: Two new distributors have been appointed to handle Lippmann's line of crushing, screening and conveying equipment — **Vancouver Equipment**

(Continued on page 176)



Over 100,000 tough miles on these engine parts!





Here is graphic evidence of the benefits provided by STANOLUBE HD-M Motor Oil in today's harder-working fleet engines.

The engine parts shown in these unretouched photographs come from a diesel bus unit which has been operated in severe start-stop service for well over 100,000 miles without overhaul. All parts are clean, pistons and valves showing only slight discolorations. Rings are free. Valves are in excellent condition with no signs of leakage. Connecting rod bearing clearances are well within manufacturer's operating tolerances, and bearings are to be reinstalled for further service.

Superior lubrication by STANOLUBE HD-M, together with an effective preventive maintenance program, has kept maintenance costs at a minimum for this midwest fleet of 117 bus units. Diesel engines each average better than 100,000 miles between overhauls. Gasoline engines individually are averaging 125,000 miles between overhauls.

The Standard automotive lubrication specialist serving your area can give you information about use of STANOLUBE HD-M in fleets with which you might be familiar. Phone your local Standard office. Standard Oil Company (Ind.), 910 S. Michigan Ave., Chicago 80, Ill.

STANDARD OIL COMPANY STANDARD *(Indiana)*

don't let HEAT

RUIN YOUR FLYWHEELS AND PRESSURE PLATES

Install Velvetouch Matched Facing Sets

Whether you're having trouble with the master facings on your tractors or the clutches in your trucks, you'll find Velvetouch Matched Facing Sets keep equipment out of the repair shop and on the job. Because Velvetouch gives you FOUR controlled friction surfaces instead of two... gives you positive protection against heat-checked flywheels and pressure plates!

In addition, Velvetouch Matched Facing Sets insure increased clutch capacity, for they DOUBLE the controlled friction area you get with conventional plates. And with Velvetouch, you can reclaim old flywheels and pressure plates that have already been heat-damaged, and put them back into service . . . better than ever!

Detailed literature available now. For further facts about Velvetouch Matched Facing Sets . . . see your supplier, call our nearest branch, or write us direct.

THE S. K. WELLMAN CO. • 200 EGBERT RD. • BEDFORD, OHIO

THE S. K. WELLMAN CO. SALES OFFICES AND WAREHOUSES

* ATLANTA—119 14th St., N. E., Atlanta 5, Georgia

* CHICAGO—1500 South Western Ave., Chicago 8, Illinois

* CLEVELAND—200 Egbert Rd., Bedford, Ohio

* DALLAS—3407 Main Street, Dallas 1, Texas

** DETROIT—18622 James Couzens Highway, Detroit 21, Mich.

* LOS ANGELES—1110 South Hope St., Los Angeles 15, Cal.

* PHILADELPHIA—1545 West Belfield Ave., Philadelphia 41, Pa.

* PORTLAND—636 N. W. 16th Ave., Portland 9, Oregon

* SAN FRANCISCO—424 Bryant Street, San Francisco 7, Calif.

* TORONTO, ONTARIO—The S. K. Wellman Co. of Canada, Ltd., 2839 Dufferin St.

** WASHINGTON—1101 Vermont Ave., N. W., Washington 5, D. C.

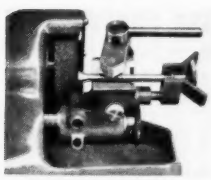
** EXPORT DEPARTMENT—8 South Michigan Ave., Chicago 3, Illinois

* SALES OFFICE AND WAREHOUSE ** SALES OFFICE

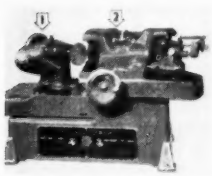
NEW B&D Valve Refacer Restores Power and Economy to Your Engines!

More Flexible Capacity built for years ahead! Takes up to 4" valve head, 9/32" to 11/16" valve stems, 0° to 90° valve angles; *traverse* grinds at *any* angle!

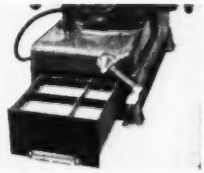
Finest Hypoid Gearing drives workhead spindle giving smoothest grinding finish.



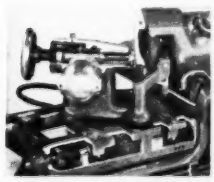
New End Grinding Attachment is extremely quick-accurate and efficient; gives you *everything* you need in one complete package!



Smooth, Abundant Power developed by two B&D universal motors, independently driving collet and wheel spindles.

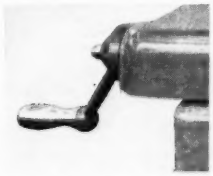


New Coolant System features wet grinding at both valve and attachment wheels, simplified one-valve control, improved coolant reservoir.

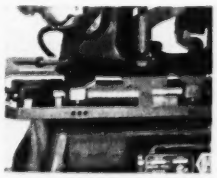


Quick-Acting Collet Clamp holds valve perfectly in line for factory-accurate grinding.

Simplified Controls improve skill of operator; free from complicated adjustments and "gadgets," tubes or wires.



Super-Speed Feed Screws for fast, accurate work; automatic end play take-up for finer finish.



4-Point Bearing Suspension for smooth, easy work table travel, greater accuracy.

NEW Black & Decker Deluxe Super-Service Valve Refacer

(Cat. No. 550) $360.00 Complete

POWER shovels, scrapers, concrete mixers, large pumps, compressors, highway trucks, etc.—gas or diesel—recondition all your engines' valves and restore their power and efficiency with the new Black & Decker Deluxe Super-Service Valve Refacer! This new Refacer obsoletes all other equipment . . . is built for the years ahead, whatever the changes in valve design! It helps you turn out valve jobs faster, gets them right the first time . . . gets equipment out of the shop and back on the job sooner! And you get everything you need in one complete package—*there are no extras to buy!*

Check the features at left and then head for your nearby Black & Decker Distributor for a demonstration. Write for detailed information to: THE BLACK & DECKER MFG. CO., 630 Pennsylvania Ave., Towson 4, Md.

LEADING DISTRIBUTORS EVERYWHERE SELL

B&D Black & Decker PORTABLE ELECTRIC TOOLS

HOW TO HANDLE WET JOBS

#20 of a Series

SINCLAIR PIPELINE
East Chicago, Ill.

Contractor: O. R. Burden Const. Co.

WELLPOINT PUMPS HANDLE 22 FT SUCTION LIFT

LOWERING 16 ft of water at this lift would ordinarily mean placing wellpoint system on a berm below ground. Actually, as photo shows, results were achieved in the simplest way, without additional excavation, the wellpoint line and pumps working from street level. Other noteworthy items revealed by the photo include: (a) pre-drainage with wellpoints on only one side of wide trench; (b) the open-cut method, eliminating costly sheeting.

• The foregoing are typical of the efficiencies of the Griffin Wellpoint systems (several used continuously) on this vast project which involved mile on mile of digging, with the majority of the pipelines laid far below ground water table in deep trenches containing water-bearing sands. Progress rate? Even in many of the swampland sections, it topped 500 ft per day. For "quick-dry" . . . specify . . . Griffin.

GRIFFIN

WELLPOINT CORP.

881 East 141st Street, New York 54, N. Y.
Hammond, Ind. Houston, Tex. Jacksonville, Fla.

In Canada: Construction Equipment Co., Ltd.
Toronto Montreal Halifax

SALES AND SERVICE

. . . Continued from page 172

Corp. Ltd., 285 E. 1st Ave., Vancouver, B. C.; and Casey-Metcalfe Machinery Co., 5107 Telegraph Rd., Los Angeles 22, Calif.

Hensley Equipment Co.: The following equipment stores have been appointed exclusive dealers in their areas—Loggers & Mill Supply, Arcata, Calif.; Lowry Equipment Co., Redding, Calif.; Fowler Engineering Sales, Ashland, Ore.; Western Equipment Co., Eugene and Portland, Ore.; Elko Blacksmith Shop, Elko, Nev.; S & M Supply Co., Grand Junction, Colo.; Gossman Scraper Works, Monte Vista, Colo.; Joe Smith Machinery Co., Denver, Colo.

Baker-Lull Corp.: The appointment of Ryan Equipment Co., St. Louis, Mo., as Shoveloader and Sweeper distributor for eastern Missouri and Southern Illinois has been announced.

On the Sales Front

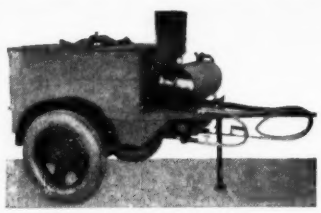
LeTourneau-Westinghouse Co.: Reorganization of the domestic sales territories of the company into Eastern and Western Divisions instead of Eastern, Central and Western, as heretofore, have been announced. J. A. Vincent continues as Eastern Division sales manager, and F. W. Duke, former district sales representative for the company, has been appointed Western Division sales manager. The line separating the respective territories divides the province of Ontario, follows the eastern shore of Lake Michigan, the southern boundary of Wisconsin, eastern boundary of Iowa, extends west along that state's southern boundary, extends down the center of Missouri to its southern boundary, extending west to Oklahoma, and then follows the eastern boundaries of Oklahoma and Texas to the Gulf of Mexico.

Champion Spark Plug Co.: The appointment of Gerald E. Ledbetter, veteran Champion salesman, as assistant sales manager has been announced. His successor is Dewey Sherman, former territory representative for Champion in the Albany area.

Insul-Mastic Corp. of America: Abner H. Bagenstose has been made eastern regional manager and John J. Miller has been placed in charge of the Midwestern territory. The two men will work from the home office in Pittsburgh, Pa.

Cook Bros. Equipment Co.: J. E. Hall has been appointed vice-president and will continue as manager of sales

(Continued on page 178)



HEATING KETTLES
FOR ASPHALT AND TAR
Fire Proof — Oil Burning
Hand and Motor Driven Spray

Other Products
CONCRETE VIBRATORS
Gasoline Engine and Electric Motor Driven Models
FRONT END SHOVELS
For Industrial Tractors
AGGREGATE DRYERS
for Stone and Sand
ASPHALT PLANTS
Portable — Stationary
Write for Circulars

White Mfg. Co.
ELKHART 6 INDIANA

This amazing new Armstrong Starter is packed with important new features — It is 50% lighter — smoother acting — easier to service and mount. The principle is based on the use of friction inside a conventional rope starter cup. Actuated by a cam principle it engages after ⅛ inch pull. Eliminates danger of teeth or pawls breaking — permits greater tolerances in mounting. Available with stationary or rotating screen. Competitively priced.

ARMSTRONG BULLDOG STARTER
HERE'S HOW IT WORKS

1. Cam actuated teeth extend to grip inside of standard rope pulley cup.

2. Spring loading retracts teeth when pull stops.

3. Rope pulley available for hand starting in case of emergency.

If you make, sell or use products like **Chains Saws • Pumps • Power Mowers • Outboard Motors**, you can reduce weight — improve starting — increase starter life.

4. Heart of unit can be incorporated in end products design.

ARMSTRONG PRODUCTS CO.
Milwaukee, Wis.

"GENERAL CONTRACTOR" and real money maker!

✻ Another contract for Gradall! To uncover pipes for repairs in oil refinery, Gradall operator can "feel" his way around other pipes and obstacles so none are damaged.

THE GRADALL is no "specialist". It's always ready to tackle all kinds of jobs—to make money for you on almost any contract you'll ever get!

Gradall carries its own quickly interchangeable attachments—always ready for work. It can get into, and work out of, places no other machine can go. Its hydraulic *down pressure* and telescoping *arm-action* boom give you the power and pin-point accuracy to work to hand-finish "specs". It eliminates costly clean-up hand labor.

And more important to you, because the Gradall *is* a "general contractor" you'll be able to bid on more jobs—to make more money. But let your Gradall Distributor *prove* it to you—ask him for a field demonstration on your own work.

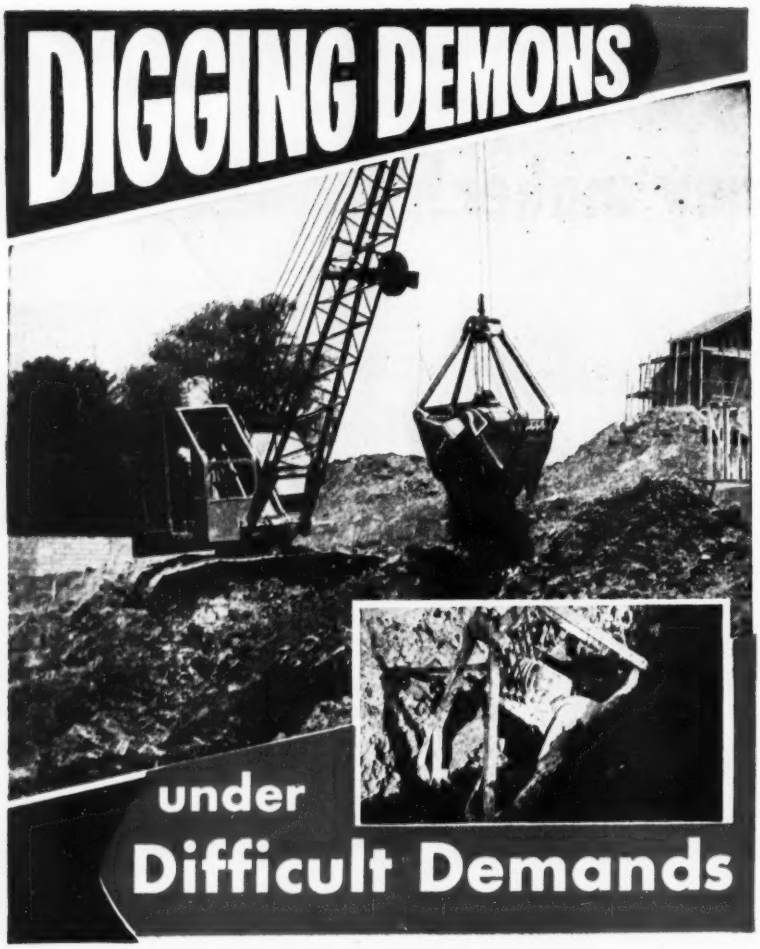
Gradall makes money for you on all these jobs and many more

- **Trenching and backfilling**
- **Excavating**
- **Placing tanks, culverts, curbs, etc.**
- **Sloping and grading**
- **Ditch digging and cleaning**
- **Ripping and loading old pavement**
- **Hand finishing and clean-up**

Gradall Distributors in over 75 principal cities in the United States and Canada

Gradall
DIVISION OF WARNER & SWASEY
Cleveland
PRECISION MACHINERY SINCE 1880

YOU CAN PRODUCE IT BETTER, FASTER, FOR LESS WITH WARNER & SWASEY MACHINE TOOLS, TEXTILE MACHINERY, CONSTRUCTION MACHINERY



The exceptional "DIG-ABILITY" of Owen Buckets has been acclaimed by crane operators and construction contractors alike since the first Owen was manufactured.

Proof of this is evidenced in the predominance of Owen Buckets seen in operation everywhere on large and small construction projects.

Write for the Owen Catalog and complete information on the line which includes an ideal bucket for every digging, handling or rehandling job.

BUCKETS AND GRAPPLES
Write for Catalog

THE OWEN BUCKET CO.
6020 Breakwater Avenue • Cleveland, Ohio

SALES AND SERVICE

. . . Continued from page 176

for both the mixers and the company's line of heavy-duty trucks and truck equipment.

Wright Power Saw and Tool Corp.: Irwin F. Woodland has been promoted to sales manager and William S. Evans was named assistant sales manager.

Winslow Engineering Co.: Establishment of new sales headquarters in Murray, Ky., and the transfer of key personnel from Oakland, Calif., to the southern city have been announced. Heading the group of men who moved east from the Pacific Coast was W. Ray Kern, the firm's general sales manager. He was accompanied by his assistant, W. B. "Bill" Walker, and division sales representative Robert A. Pelusi.

International Harvester Co.: Has established an Industrial Power Division sales department. Also announced was the appointment of I. P. Payne as manager of the new department. Assisting Payne will be W. M. Holland and C. E. Jones who have been appointed assistant managers of sales.

Baldwin-Lima-Hamilton Corp.: Jack Watson has joined the Construction Equipment Division as sales representative covering northern Illinois and the lower peninsula of Michigan.

Hercules Powder Co.: George A. Parker has been appointed manager of the explosives sales office in Pittsburgh, Pa., and Thomas E. Brown manager in Hazelton, Pa. Jack D. Hayes, Jr., has been named director of operations and Clarence W. Ballard director of sales for the Explosives Department.

Le Roi Co.: Has announced the formation of a new division for the manufacture of front-end loaders and truck-mounted mixers. N. M. Sedgwick, formerly general sales manager for the Construction and Mining Division, will be general manager of the new division which will be known as the Le Roi-Transo Division. W. D. Lund will be assistant general manager. Replacing Sedgwick as general sales manager will be R. H. Rodolf. C. L. Meigs has been named manager of portable compressor sales and A. J. Jensen assistant to the general sales manager, Construction and Mining Division.

Nordberg Mfg. Co.: Appointment of J. D. Grace as sales manager, Screen Department of the Crusher Division, has been announced.

Iowa Mfg. Co.: Kenneth V. Turner has been appointed district repre-

(Continued on page 181)

GULF PRODUCTS *and* FINE SERVICE

keep equipment rolling

on U. S. Naval Air Station Project

Ballenger Paving Co., Greenville, S. C., has the contract for extending and widening runways and taxi strips at the U. S. Naval Auxiliary Air Station, Sanford, Fla. The contract involves laying 134,000 square yards of 10-inch reinforced concrete pavement. The Ballenger Paving Co., as well as their hauling contractor, R. S. Woodleif, also of Greenville, S. C., get top performance from equipment by the use of Gulf quality lubricants and fuels.

IT'S a speedier, more profitable job when equipment performs smoothly and dependably. And the use of quality petroleum products is one of the surest guarantees of this kind of performance.

That's why so many contractors on the big, tough jobs specify Gulf lubricants and motor fuels. They have found that Gulf lubricants provide better protection for every gear and bearing; and that Gulf fuels help insure efficient engine operation.

Gulf products and fine service work as a team to help contractors get more hauls, fewer overhauls, and bigger profits!

Let us discuss with you how they can help you on your next job. They are available to you through more than 1400 warehouses. Write, wire, or phone your nearest Gulf office.

GULF

Blasted rock is hoisted up the shaft in dump cars which are emptied into trucks for disposal. This contract is a part of Philadelphia's sewer improvement program.

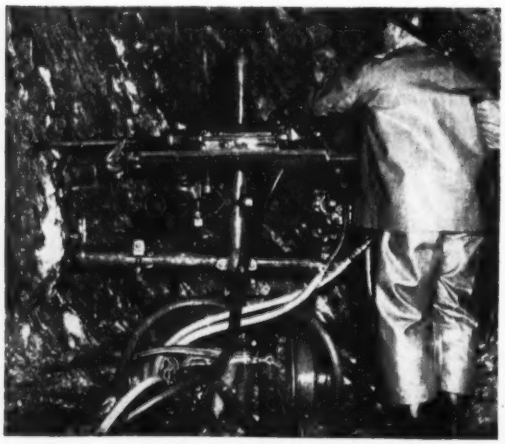
Battling hard rock and underground water in 4200-ft Philadelphia sewer tunnel

Dominic J. Lombardi (center) talks drill steel and bits with J. A. Klemeyer (left) and Wayne D. Burnside (right) of Brunner & Lay Rock Bit Corp. The bit shown is a 4-in. Rok-Bit with cutting edges of tungsten carbide; it's attached by means of an adapter to a 1¼-in. rod of Bethlehem Hollow.

Hard, abrasive rock is usually trouble enough for a tunnel-driving contract, but Joseph Lombardi & Sons also had to contend with heavy flows of underground water in driving a 6-ft diameter tunnel for the City of Philadelphia. The $588,000 contract calls for some 4200 ft of 6-ft tunnel.

Drilling, blasting, and mucking is carried on at several headings served by two shafts from the surface. Using jumbos which mount two 3½-in. drifters, the contractor has been averaging about 11 ft of advance daily at each heading, operating one shift. About 20 holes are drilled, 6-ft deep, in a typical round. Both 1⅝- and 1¾-in. carbide-insert type bits are used. Relief holes are drilled with 4-in. bits, attached by means of a bit adapter on 1¼-in. rods of Bethlehem hollow drill steel.

Lombardi expects to drill a total of about 75,000 ft of hole before the tunnel is completed. The rock has been mostly Baltimore Gneiss, known locally as Burholme Granite. In any case, the drilling crews can testify that it's both hard and abrasive.



Slickers and boots are regulation in the tunnel because of the constant "rain" and seepage which sometimes floods the tunnel, halting operations until the pumps can bail it out. This special jumbo, mounting two drifters, puts in about 20 holes of 6-ft depth each round.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

TWO GRADES OF

BETHLEHEM HOLLOW DRILL STEEL

- *The "Old Reliable" carbon type*
- *Ultra-Alloy, our chrome-moly grade*

BETHLEHEM STEEL

SALES AND SERVICE

. . . Continued from page 178

sentative with headquarters in Dallas, Tex. His territory covers New Mexico, Texas, Oklahoma, Arkansas and Louisiana.

Marquette Cement Mfg. Co.: Henry J. Auer has been promoted to sales manager for the metropolitan Chicago area.

Armco Drainage & Metal Products, Inc.: G. R. Betts has been appointed sales manager of the O'Neall Division.

Crucible Steel Co. of America.: Announces the appointment of Edward LeMaire as sales engineer for the company's drill steel division in the eastern U. S. territory.

Delta Power Tool Div., Rockwell Mfg. Co.: Announces the establishment of a new regional distribution set-up involving appointment of four regional managers. The four are Byron Coon of Oakland, Calif., Western Division; George H. Madeska, Chicago, Ill., Central Division; Walter H. Redpath of Toronto, Ont., Canadian Division; and George E. Rockwell of New York City, Eastern Division.

Motorola Communications and Electronics, Inc.: Richard J. Clark has been appointed parts depot manager of the newly established regional parts depot in Dallas, Tex., located at 171 Parkhouse St.

Preco Incorporated: Has appointed Gerald L. Duffy district representative for the eastern U. S. and Canada. He will work out of Harwich, Mass.

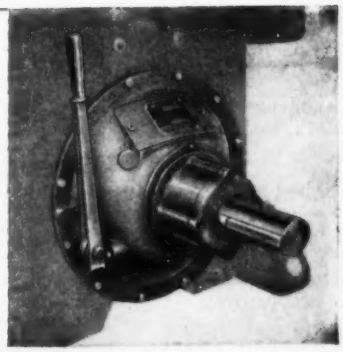
Cummins Engine Co., Inc.: Wilmot Sandham has been appointed Cummins Southwestern Regional Manager, with headquarters at 411 W. Fifth St., Los Angeles, Calif.

The Frank G. Hough Co.: Announces the appointment of Kenneth B. Larkin as district representative for Washington, Oregon, Idaho, Montana and the Canadian Provinces of British Columbia, Alberta and Saskatchewan. He replaces H. E. (Gene) Thomas who becomes district representative for Illinois, Michigan, Indiana, Ohio, Kentucky and eastern Missouri.

Hyster Co.: Philip S. Hill has been named vice-president in charge of sales.

L. B. Foster Co.: Announced the establishment of a new office in Los Angeles to serve the West Coast industrial market. The office will be headed by Henry E. Fleishman, vice-

FOR LONG-LIFE ECONOMY
RE-POWER WITH—
FUNK
POWER TAKE-OFFS
AND
GEAR REDUCTION POWER TAKE-OFFS



OTHER FUNK ITEMS:
Right Angle Take-Offs.
Front End Take-Offs.
Jack Shaft Extensions.

Ford Tractor Conversion Kit adapts 6 or V-8 engine, doubles power.

Special gear reduction with two shafts, one turning same speed and rotation as engine, the other anti-enginewise at optional reduction.

. . . are available with over-center clutches for all engines with SAE flywheel housings. Gear reduction units feature exclusive straddle mounted pinions; special ratios and special adaptions of standard units. Wide selection of standard types, sizes and ratios stocked for immediate shipment.

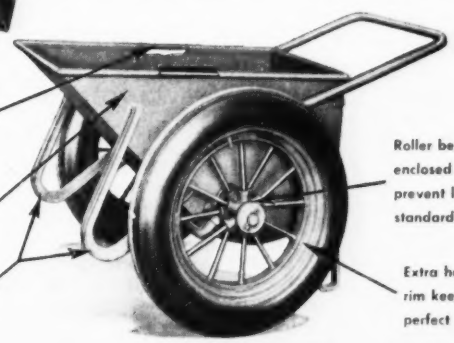
WRITE FOR CATALOG!
—our engineers will be glad to assist with your power problems.

Funk F
FUNK AIRCRAFT CO.
3303 Airport Drive Coffeyville, Kan.

STERLING CARTS
For Wheeling Concrete and other Materials

IT STANDS ALONE

Investigate the unusually sturdy construction of this perfectly balanced cart. It's the best that money can buy. Outlives any other cart. That's why it costs less. Choice of 30" dia. steel wheels or pneumatics. Illustration shows No. 626-PR Cart with dumping rockers and pneumatic tires, 6 cu. ft. capacity, water full. Eight other models. Write for Catalog No. 63.


Top edge reinforced with continuous ½" dia. butt-welded rod.
Tray is made of 14 gauge steel.
1¼" T-iron rockers facilitate dumping and cleaning out.
Roller bearings, enclosed in cage to prevent locking, are standard equipment.
Extra heavy steel rim keeps wheel in perfect alignment.

STERLING WHEELBARROW CO., Milwaukee 14, Wis.
Look for this Mark of STERLING Quality
Sterling WHEELBARROWS

president of the organization, and will be located at 3460 Wilshire Blvd., Los Angeles 5, Calif.

Orangeburg Mfg. Co., Inc.: Harding L. Taylor, formerly director of the plumbing division of the Arkansas State Board of Health, has been appointed Southwest District Manager.

American Chain & Cable Co., Inc.: Henry Ervin has been elected vice-president and director of sales with headquarters at 230 Park Ave., New York, N. Y. Harry Williams has also been elected a vice-president with headquarters in the Detroit office, 601 Stephenson Bldg.

All-State Welding Alloys Co., Inc.: Has appointed Kenneth V. Lutz of St. Louis, Mo., general field manager.

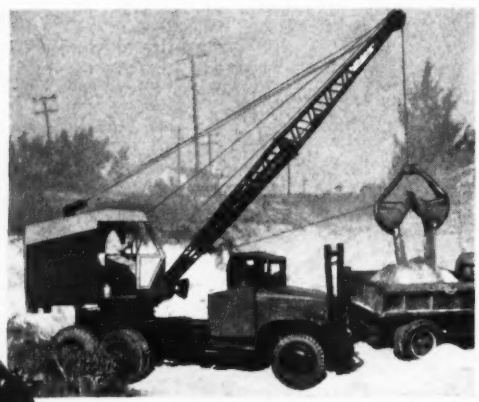
Hobart Brothers Co.: Clyde P. Whitmire has been named manager of the new Hobart Welder and Sales Service branch office and warehouse at 1535 S. Yale St., Tulsa, Okla.

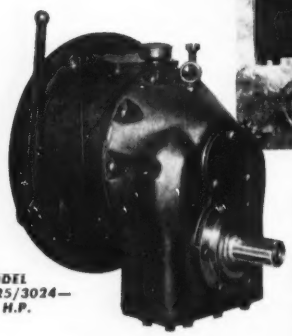
Lessman Mfg. Co.: Announces the appointment of Elmer V. Mrozek as sales promotion manager.

Nelson Stud Welding Div., Gregory Industries, Inc.: Has announced the establishment of three new direct factory branch warehouses at Atlanta, St. Louis and Denver. Herbert W. Scott, Jr., southeastern district manager, will be in charge at 696 Whitehall St., Atlanta; Donald Duffey heads the St. Louis territory which will be served from 1937 S. Vandeventer St.; and Vincent G. Probst will be in charge of the Denver factory branch at 1416 Blake St.

Flexible Steel Lacing Co.: Howard Gill has been assigned to cover Mississippi, Alabama, Georgia, Florida and western Tennessee.

S-N REDUCTION GEARS





MODEL 2225/3024—40 H.P.

SPECIFIED AS ORIGINAL EQUIPMENT

ON HIGHLY MOBILE DIXIE CRANES

Designed for high speed operations that require a mobile unit, these three-eighths yard bucket Dixie Cranes — made by the Freshwater-Smith Machine Company, Ft. Pierce, Florida — are equipped with S-N Heavy Duty Herringbone Reduction Gears as original equipment in order to insure **maximum versatility** and the **smooth transmission** of **full power** from engine to load — smoothly — and at a minimum cost.

These rugged, compact S-N Reduction Gears are built for grueling, continuous operations with all types of engines from 40 H. P. units to 775 H. P. giants! They can be installed as original equipment or for repowering of pumps, shovels, generators, compressors and all types of dredging and ditching equipment. Available in a broad range of reduction ratios — of 1.5:1 up to 4:1. Our engineers will be glad to specify the best unit for maximum performance on your equipment. Write today for detailed catalog sheets. Address Industrial Division.

SNOW-NABSTEDT

Transmission Engineers

FOR NEARLY HALF A CENTURY

THE SNOW-NABSTEDT GEAR CORP., HAMDEN, CONN.

Special Mention

Alloy Rods Co.: Construction has started on a new plant located in El Segundo, Calif. The new plant, to be known as the Pacific Coast Division of Alloy Rods, will produce a complete line of alloy arc-welding electrodes to serve the entire Pacific Coast and Rocky Mountain states. It is expected to be in full operation by October 1.

Worthington Corp.: Has revealed plans for an expansion and modernization program at its Plainfield Works. Within the next nine months the corporation expects to spend more than $1 million to increase its production of construction equipment, positioning machines and industrial mixers by one-third.

Chicago Pneumatic Tool Co.: Announced that it has acquired the assets of the Jacobs Mfg. Co. of West Hartford, Conn., manufacturers of Jacobs Chucks. Manufacturing and sales operations will not be affected by the sale and will be carried on without change by a new wholly owned subsidiary of Chicago Pneumatic called The Jacobs Mfg. Co. (a New Jersey Corporation).

Wisconsin Motor Corp.: Has purchased a plant formerly occupied by Sterling Motor Truck Co., Milwaukee. The purchase comprises 6 acres of real estate, including railroad sidings and 143,000 sq ft of plant facilities under roof. Some departments will be moved from the present Wisconsin Motor plant at 1910 S 53rd St. to the new plant.

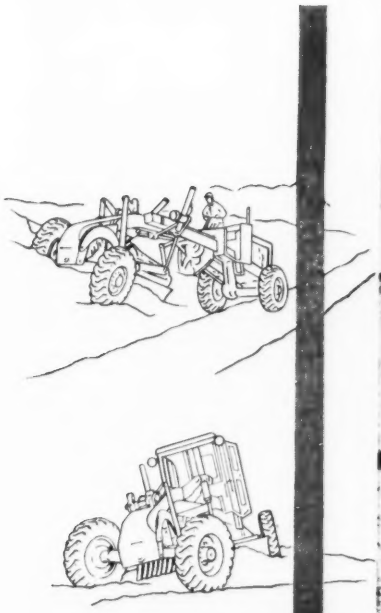
Association Activities

Portland Cement Assn.: W. J. McIntosh has been appointed district engineer in charge of the New York office. He succeeds John F. Hall who has resigned.

The Asphalt Institute: Arvin S. Wellborn, former managing engineer of the Pacific Coast division of the Institute, has been promoted to chief engineer of the Institute, with headquarters of 801 Second Ave., New York 17, N. Y.

all-wheel drive*... **teamed with** ...all-wheel steer*

gives you controlled traction*



front drivers **PULL**

rear drivers **PUSH**

* only AUSTIN-WESTERN has it

Whenever you see the grader in an offset position, as in the illustrations on this page, you can be sure that it is moving more material farther and faster than any other grader can do it.

"Controlled Traction" is the reason—and controlled traction is possible only in a grader with the directional control of All-Wheel Steer, plus the "push-pull-power" of All-Wheel Drive.

By offsetting the machine, the operator can put front and rear wheels where traction is best, can eliminate all side-thrust at the toe of the blade (which can be utilized to its entire length), and can balance the whole power of the grader against the load.

Austin-Western

Power Graders • Motor Sweepers
Road Rollers • Hydraulic Cranes

Construction Equipment Division

Manufactured by
AUSTIN-WESTERN COMPANY
Subsidiary of Baldwin-Lima-Hamilton Corporation
AURORA, ILLINOIS, U.S.A.

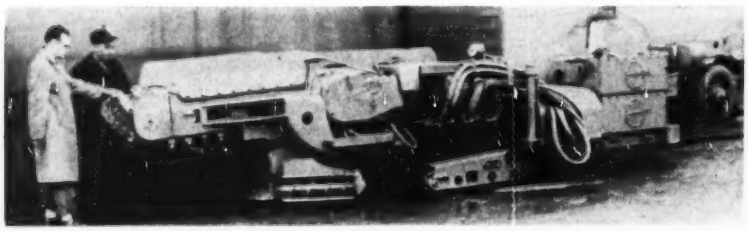
CONSTRUCTION EQUIPMENT NEWS

Loader With Torque Converter

Extra yardage, higher output, less breakage and smoother operation are claimed for this new Pettibone Model 15, 1½-cu yd front-end loader. Equipped with torque converter, this Speedall provides better control without shifting speeds or slipping clutch.—**Pettibone-Mulliken Corp., Chicago, Ill.**

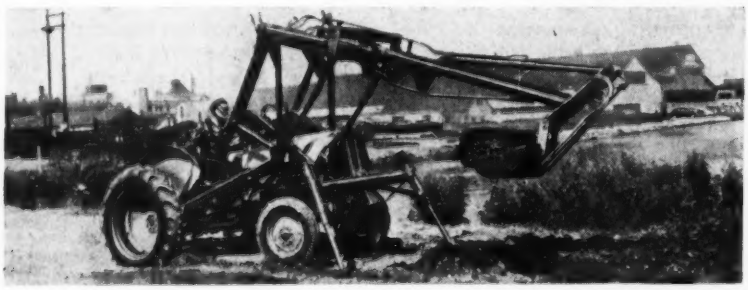
20 Seconds for a 20-In. Tree

Designed for the man who wants lots of power, the new Homelite Model 5-30 Chain Saw purrs through a 20-in. tree in 20 sec. Timber up to 5 ft in dia cut easily and quickly. It's lightweight, well-balanced, and will cut in any position on all types of cuts. —**Homelite Corp., Port Chester, N. Y.**



Everyone Is Happy Now

Out in Euclid, Ohio, the residents couldn't stand the noise and damage from blasting and digging on a sewer project, so National Construction Co. brought in this Joy continuous mining machine to dig the sewer. An unusual operation. —**Joy Mfg. Co., Franklin, Pa.**



Low-Priced Trencher and Ditcher

A new trencher and ditching machine claimed to sell for approximately 30% less than comparable units, has been announced. The unusual design makes it the only front-mounted unit on the market, according to the manufacturer. The unit will fit most wheel and crawler tractors.—**Wagner Iron Works, Milwaukee, Wis.**

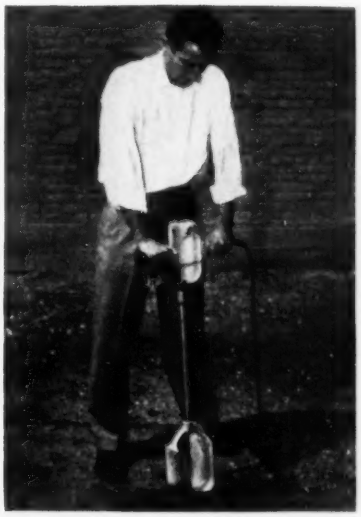
For Longer Rim Life

Bond-A-Coat, a new material is claimed to be far superior to galvanizing. The finish is similar to that of zinc plating.—**Goodyear Tire & Rubber Co., Akron, Ohio**

On-the-Job Previews of Machinery, Tools and Equipment

Four in One

This Sargent 38 can be obtained with four interchangeable attachments—dragline, shovel, crane and trenchhoe. The manufacturer claims the tool has greater flexibility, more visibility and more cab room. It can be mounted on a half-track or any 6-wheel truck. Powered by either a Hercules JX-4C gas engine or Oliver 193 diesel.—**Sargent Engineering, Inc., Fort Dodge, Iowa**

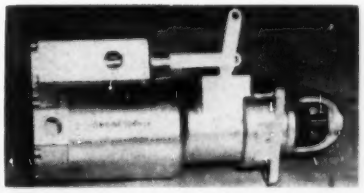


Digs a Hole a Minute

This electric powered Super Hole-A-Matic digs holes at any angle, from 4 to 6 in. dia, up to 6 ft deep with a shaft extension. It can tunnel up to 12 ft. **Multi-Matic Corp., Van Nuys, Calif.**

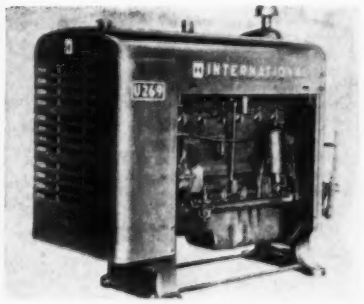
More Powerful Pusher

Caterpillar has announced a tractor adapted specifically for tandem pusher loading work. Called the D8 Pusher Tractor, it is 150 hp and is equipped with No. 8S bulldozer and No. 25 cable control. The weight has been increased to 50,025 lb, and a new transmission has been added.—**Caterpillar Tractor Co., Peoria, Ill.**



Hydraulic Cranking Engine

This compact, hydraulic cranking unit works in all climates and all temperatures. It's called the Hydrotor.—**Hydramotive, Inc., Cleveland, Ohio**

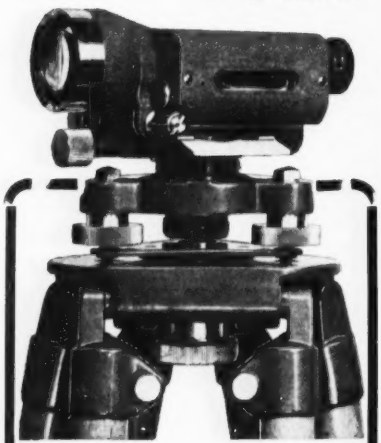


International Adds 7 Models

With the addition of 7 new 16-cyl models the International Harvester gas-gasoline power unit line now includes 12 engines ranging from 16.5 to 200 net maximum horse-

From the Wheel That Built An Empire . . .

Kern AARAU



Fabulously wealthy . . . rich beyond description . . . the land of the Pharaohs drew its glory bucket by bucket from the muddy Nile . . . brought to its fields by the straining back of a slave and the creaking gear of the water wheel.

THE KERN NK2 LEVEL

The latest in modern design—amazingly compact and only 3½ lbs in weight . . . the superb Kern NK2 level actually possesses a mean accuracy of ± 1/100th ft. per mile. Designed for one hand operation all controls are easily accessible on the right side. 24X telescope, plus coated optics throughout give unbelievable brilliance. Each instrument features a bullseye bubble for rough leveling plus a coincidence bubble for fine leveling. Another demonstration of Kern skill and craftsmanship. Write TODAY for complete information and details.

Complete Service Department
Factory Trained Personnel

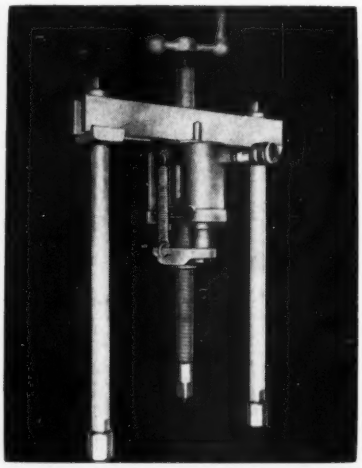
KERN SURVEYING INSTRUMENT DIVISION

Paul Reinhart Co., Inc.

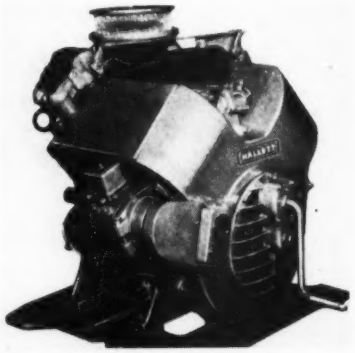
70 Beaver St., New York City

EQUIPMENT NEWS . . . Cont'd

power. The new U-1091 power unit rated at 200 hp and the UD-24 diesel power unit have many common components. Principal differences are that the UD-24's gasoline starting system and diesel fuel injection system have been eliminated in the new U-1091 power unit. The six other new models are power units using International motor truck engines. **—International Harvester Co., Chicago, Ill.**

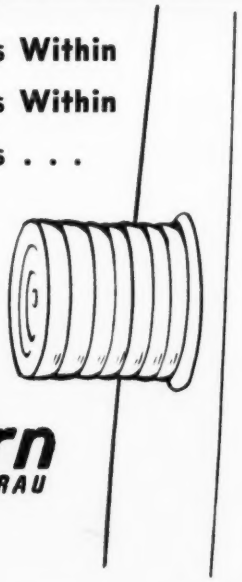


HYDRAULIC RAMS AND PUSH-PULLERS—The OTC Push-Pullers have been adapted to the OTC Power-Twin center hole hydraulic rams and can now be used with hydraulic power to speed up maintenance pulling and installing operations involving gears, bearings, sheaves, pulleys, pinions and couplings. Capacities range from 17½ to 50 tons. Owners of OTC Push-Pullers may adapt it for use with the center hole ram by ordering an inexpensive attaching plate.**—Owatonna Tool Co., 380 Cedar St., Owatonna, Minn.**

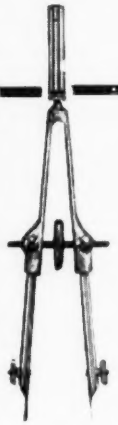


AIR-COOLED DIESEL — Currently being produced is a new 2-cyl Hallett air-cooled diesel engine. It is 4-stroke cycle, with 3½-in. bore and 3¾-in. stroke. It is rated at 13 hp continuous load and weighs 25 lb per hp.**—Hallett Mfg. Co., Inglewood, Calif.**

Wheels Within Wheels Within Wheels . . .



Kern AARAU



MODEL 1082

Taken for granted, often overlooked, the center wheel of your bow problem represented an enormous problem for Kern engineers. Ordinary wheels, in time, warp and wear slightly . . . destroying the absolute precision every Kern instrument must have. The answer was lamination . . . the careful manufacture of this tiny wheel layer by layer. A tiny detail, yes, but one that represents in essence the care and study that lies behind the Kern name.

FAMED KERN TRADITION

Meticulous attention to every minute feature . . . painstaking devotion to every single facet . . . every minute feature of your instrument. . . . These are the secrets of Kern superiority . . . the hidden guarantees that give you performance and dependability beyond compare.

SEE OUR COMPLETE LINE

Write today for our new, fully illustrated catalogue of sets and individual pieces. Set prices from $15 to $100. Bow divider pictured $4.70.

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Borden & Riley Paper Co.

60 E. 11th Street, New York City

T5X Cuts Operating Costs

If engine breakdowns are keeping your operating costs too high . . . then change to T5X motor oil. Heavy-duty T5X, the amazing *purple* motor oil, can boost your profits by guarding against costly engine breakdowns.

Even under the most *severe* conditions—dust, heat, rain and heavy loads—T5X gives *superior* engine protection. T5X lubrication protects rings, bearings and other moving parts against wear, and greatly extends overhaul periods.

T5X is made from an unusual combination of the *finest* base stocks and special-purpose compounds. This amazing *purple* oil protects against the clogging effects of sludge. And T5X keeps engines cleaner by retarding the formation of lacquers and varnish.

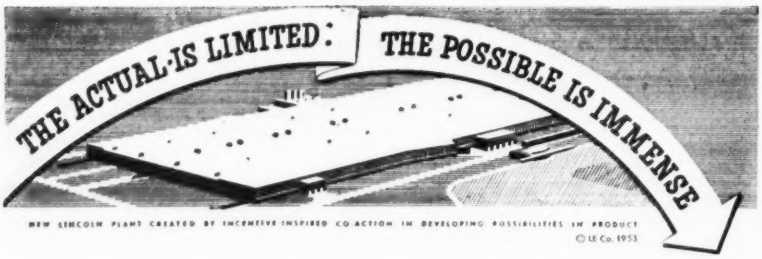
Test T5X on your *toughest* job. Compare the performance of T5X with the motor oil you now use. You'll agree with construction men everywhere that T5X lubrication means less wear, lower maintenance costs and greater engine protection under *every* operating condition.

OFFICES: LOS ANGELES: Union Oil Building • NEW YORK: 45 Rockefeller Plaza • CHICAGO: 1612 Bankers Building
CINCINNATI: 2111 Carew Tower Building • NEW ORLEANS: 917 National Bank of Commerce Building

UNION OIL 76 COMPANY OF CALIFORNIA

T5X motor oil was developed by the makers of UNOBA—the original multi-purpose grease.

(Advertisement)


THE ACTUAL IS LIMITED: THE POSSIBLE IS IMMENSE
NEW LINCOLN PLANT CREATED BY INCENTIVE INSPIRED CO-ACTION IN DEVELOPING POSSIBILITIES IN PRODUCT
© LE Co. 1953

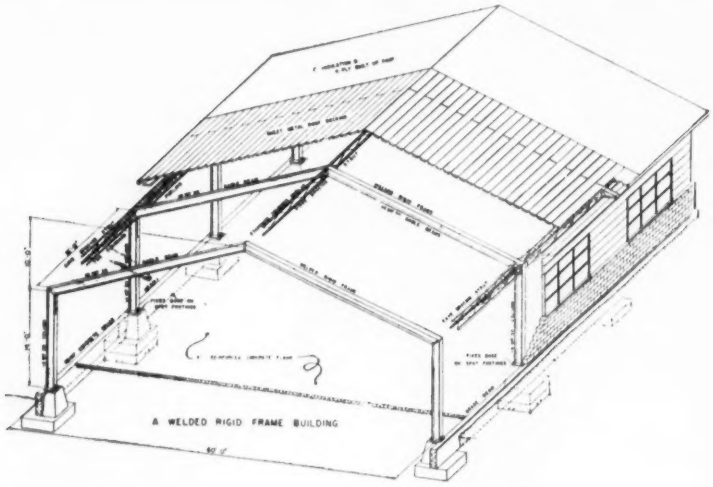


Fig. 1. Welded Frame Building *uses longitudinal rigidity of roof by running welded roof decking lengthwise.*

SIMPLE CONSTRUCTION USES PLAIN STEEL SHAPES

Eave Bracing Strut consists of two standard welded open web roof joists of the same depth as the depth of the 14″ W.F. 30 lb. rigid frame beam set in positions so that one trussed purlin is normal to the roof and the other normal to the wall and with the inside edges of their bottom flanges joined together by welding to form an angle strut.

These standard purlins are butt welded to the edges of the rigid frames to constitute the main portions of the strut while the outside corner is made of another piece of bent plate.

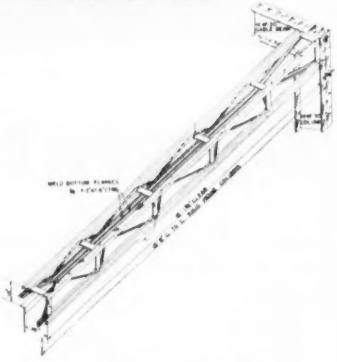


Fig. 2. *Eave bracing strut.*

This plate is bent to conform to the shape of the outside corner of the rigid frame so that it can also be butt welded in between the frames to constitute the outside corner strut.

It is then joined to the other trussed purlin sides by means of the intermediate 3″ x ¼″ tie plates located in the planes of the roof and wall surfaces. Thus a strong and sturdy box strut is made of standard and easily obtainable elements so that it will brace the knee against all of the various and sundry forces that can combine to cause buckling.

Studies in Structural Arc Welding free on request.
Designers and engineers write on your letterhead to Dept. 2705.

THE LINCOLN ELECTRIC COMPANY
CLEVELAND 17, OHIO

THE WORLD'S LARGEST MANUFACTURER OF ARC WELDING EQUIPMENT

DESIGN IDEA CUTS COST 20% SAVES STEEL

By **Ned L. Ashton**
Consulting Engineer
Iowa City, Iowa

THE popularity of the rigid frame type of building for such structures as warehouses, industrial plants, churches, bowling alleys, swimming pools, gymnasiums, auditoriums, garages, super-markets, etc., demonstrates its attractiveness and efficiency.

By eliminating splice plates and rivets, and utilizing the benefits of rigid framing, cost savings averaging 20% are realized on many types of building construction. Fewer man-hours and simpler equipment are required for erection.

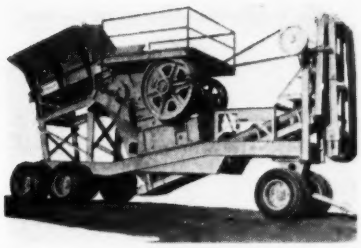
At the present time most rigid frame buildings, made possible by arc welding, are built as two hinged frames with auxiliary purlins and girts running lengthwise of the building to support roof decking and sidewall material running crosswise. The purlins, usually consisting of small channels or angle and zee bar sections or light open web welded joint sections, are placed on top of the frames and the strength of the decking is not utilized for any other purpose.

The building frame in Fig. 1 is made differently. It consists of a typical 60′ x 150′ building 14 feet high at the eaves and 24′ at the center. The metal decking rests directly on top of the rigid frames and spans lengthwise of the building without the aid of any other auxiliary purlins.

When the roof decking is combined with the bracing purlins at the eaves and with the ridge strut it constitutes a strong lateral girder which prevents the intermediate rigid frames from moving sideways at the eaves.

Longitudinal rigidity of the roof, which is accomplished by running the decking lengthwise, constitutes an improvement compared to the conventional type of two hinged frame buildings with auxiliary purlins.

The bracing action of the roof is so helpful that the rigid frames can all be fixed at the bases with ordinary sized footings and the frames can be made of ordinary smaller sized wide flanged "I" beams throughout the full length of the frame without any special haunched or tapered sections at the knee.



NOW WITH VIBRATING GRIZZLY—A new Cedarapids portable primary crushing unit, known as model AAA-GR, has been redesigned to incorporate a vibrating grizzly to act as a by-pass for materials under crushing size. The new design is claimed to reduce the load on the jaw crusher and insures larger crushing space, higher capacity and lower maintenance.—**Iowa Mfg. Co., Cedar Rapids, Iowa**

WIRE BRAID AIR HOSE—A new heavy-duty air hose suitable for working pressure up to 400 lb per sq in., reinforced with a single braid of high-tensile steel wire, yet still flexible has been announced by Goodrich. The new hose, called "Commander" is designed for rugged service in mines, quarries, construction projects and general industrial use. It comes in ½-, ¾-, and 1-in. sizes.—**B. F. Goodrich Co., Akron, Ohio**

ROCK-TYPE DUMP BODY — Designed to withstand the hard shock of power shovel, chute and conveyor loading, a new rock-type dump body is available in from 5- to 15-cu yd sizes. According to the manufacturer, the new rock-body design eliminates side bulging which is the most common cause of body failure. Need for a tailgate is eliminated by using a 15-deg, scow-type rear end, supported by angular box braces which are an extension of the understructure longitudinals. This sloped rear packs the load firmly in place. A "distorber" mounted on each side of the truck body and hoist frame absorbs damaging warp and strain and is said to greatly reduce body maintenance expense and to assure longer dump-body life. — **The Galion All Steel Body Co., Galion, Ohio**

325° F. Solutions and Pressures to 400 lbs. Make Short Work of Grease, Oil, Dirt and Rust

This shop switched to a MALSBARY 300 heavy-duty cleaner for steam cleaning scrapers, tractors and dozers before painting. Its high pressures blast grease, oil, dirt and rust from 17½-yard scrapers in an hour or less. That's 3 times faster, reports methods engineer, than previous steam vapor cleaner did. And downtime is practically unheard of—this MALSBARY 300 works 8 hours daily, 5 days a week.

Why Malsbary Does More, Quicker

Cleaning equipment is much like washing your hands—the dirtier they are the more you need lots of solution (soap and water), heat and pressure. With MALSBARY exclusive patented pumping system you get all three—volume, heat, high pressure. For example, you:

Steam clean at 150-250 p.s.i. yet keep solution at 325°F.—an impossibility with other cleaners.

Rinse with 300-2100 gallons of warm water per hour.

Blast stubborn dirt with cold water at 400 p.s.i.

See for yourself—*fill in coupon NOW.*

Heavy-duty MALSBARY cuts average cleaning time to—
D6, D7, D8 . . . . . 1½ to 2 hrs.
Motor Grader . . . 3½ hrs.
Payloader . . . . . 45 minutes
Street Sweeper . . 2 hrs.

MALSBARY MANUFACTURING CO. SINCE 1921

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I AM INTERESTED IN —
☐ On-the-job demonstration.
☐ Free booklets on MALSBARY Cleaners.
☐ "How To Make Efficient Use of Steam Cleaning" reprint.

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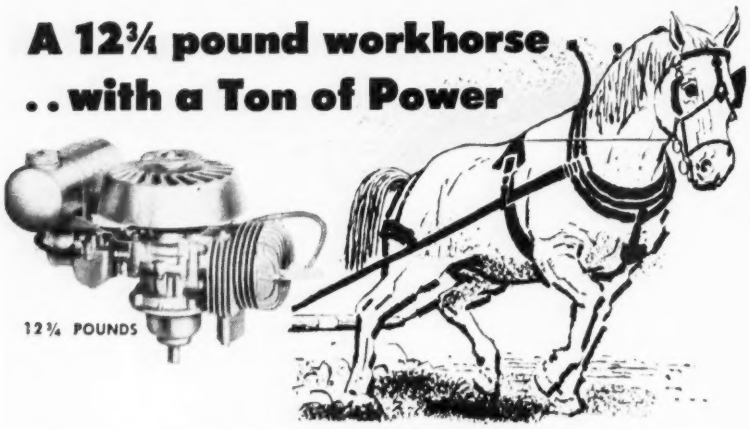
46

A 12¾ pound workhorse . . with a Ton of Power



The POWER PRODUCTS *Lightweight* packs more power per pound

When it comes to lightweight power nothing can touch this engine. Not only is it amazingly lightweight, but it has every important quality feature to assure long, dependable performance

- LIGHTWEIGHT
- MINIMUM EFFORT STARTING
- LONG LIFE, LESS MAINTENANCE
- FULL CARBURETION
- BALL BEARING MAIN BEARINGS
- SEALED DRIP PROOF CRANKCASE
- FULLY ENCLOSED FLY-BALL GOVERNOR
- NO OIL CHANGING OR CHECKING
- CLOG FREE COOLING SYSTEM

For portable equipment, you can't find a better engine for lightweight and dependability.

be modern • go *Lightweight*

POWER PRODUCTS CORPORATION
GRAFTON, WISCONSIN

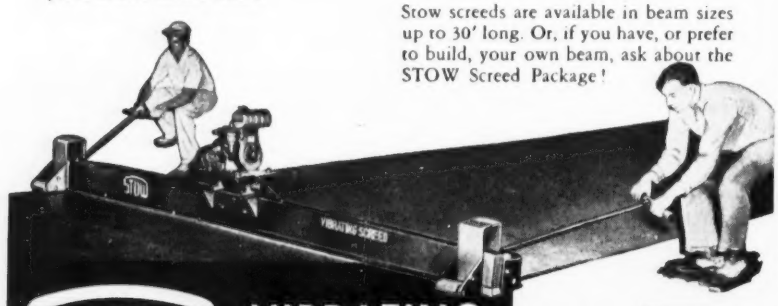
"SAVED $800 PER MILE with my new STOW SCREED!"

Performance like that is *important* on *any* paving job. It's the reason why so many contractors are now using STOW screeds on all their road paving jobs!

STOW vibrating Screeds:

1. Permit placing more than 300 cubic yards in less than 8 hours
2. Strike off and impact in one operation
3. Leave surfaces true to grade
4. Work up to and around manholes and obstructions
5. Have record of proven trouble-free performance *on the job!*

Stow screeds are available in beam sizes up to 30' long. Or, if you have, or prefer to build, your own beam, ask about the STOW Screed Package!

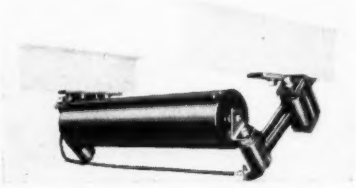


STOW VIBRATING SCREEDS

STOW MANUFACTURING CO.
31 Shear St., Binghamton, N. Y.

Write today for complete information on Stow Vibrating Screeds and the Stow Concrete Vibrator line. Request bulletin 526.

TABLE CONVERTS SAW—A rigid, steel table with angle guard and fence makes short work of converting portable electric saw into a table saw. Designed primarily for the seven models of Porter-Cable electric hand saws, the inverted saw is mounted to the underside of the table with the blade protruding through a slot. Depth and angle of cut are adjusted by controls already built into the saw itself. Two knurled knobs hold the rip fence square at any position along a steel guide track. A calibrated angle gage rides in a slot parallel to the fence and assures square or angle cuts. Cost is $39.50, less saw.—**Porter-Cable Machine Co., 20 Exchange St., Syracuse, N. Y.**



NEW-TYPE RETURN IDLER — A new-type belt training return idler, which provides automatic alignment for the return belt without the use of side guide idlers, has been developed by Chain Belt. It is claimed the new idler design assures positive aligning action and greatly reduces the danger of damage from belt roving. The idler consists of a dead shaft roller-bearing return roll, mounted at each end to a toggle-like arrangement of swivel arms suspended from the conveyor framework at an angle of approximately 45 deg in the direction of belt travel. Lateral movement of the belt to one side results in increased weight on that side which, due to the idler construction, causes that end of the roll to move forward and downward. At the same time, the opposite end of the roll is moved backward and upward and this changing of the normal position of the roll with the belt, guides the belt back to the central position.—**Chain Belt Co., Dept P.R., Milwaukee 1, Wis.**

22 HEILINERS

NEW JERSEY

SPEED EARTHMOVING ON THE GARDEN STATE PARKWAY

BIG earthmoving jobs like the $300,000,000 Garden State Parkway, and big-producing Heiliners just naturally go together. Heiliners combine all the advantages of fast loading, big capacity, plenty of power, high speed, and "tilting floor" positive forced ejection (the simplest and most efficient known!) with a host of other features that pay off in profit on any job.

- **8 HEILINERS for GEORGE M. BREWSTER & SON, INC.** of Bogota, N.J. are operating near Red Bank, N.J., moving over a million yards of sandy clay loam at a rate of 225-cu. yds. per hour per machine. Loading time per unit averages 45 seconds in 60 ft. and the 1200-ft. round trip time average is 3 to 3½ minutes.
- **5 HEILINERS for CONSTRUCTION AGGREGATES CORP.** of New York are moving 112-cu. yds. of sand per hour per unit on the section of the Garden State Parkway south of Morganville. Loading time averages 40 to 65 seconds in 200 ft., and average cycle time for the 8400-ft. round trip is 8 minutes.
- **4 HEILINERS for FRANK STAMATO & CO.,** of Lodi, N.J., are working near Eatontown and in Ocean County where the contractor had to meet a variety of tough conditions ranging from very wet to dry sand and gravel.
- **3 HEILINERS for J. F. CHAPMAN & SON** of Hillside, N.J., have contracts for grading, draining and structures near the north end of the Parkway working in material ranging from rock and shale to sand and gravel.
- **2 HEILINERS for REID CONTRACTING CO.** of Woodbridge, N.J., are operating near Toms River, and have a lot of tough conditions to meet such as a high water table, sand and gravel with clay and new haul roads.

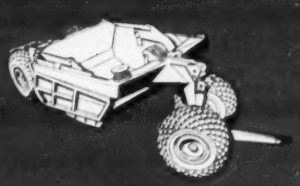
THE HEIL CO.

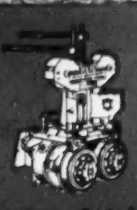
DEPT. 293 3002 WEST MONTANA ST., MILWAUKEE 1, WISCONSIN

Factories: Milwaukee, Wis. — Hillside, N. J.

Sales Offices: New York, Union, N.J., Washington, D.C., Atlanta, Cleveland, Milwaukee, Detroit, Chicago, Kansas City, Denver, Dallas, Los Angeles, Seattle; Rio de Janeiro, Brazil

R 20





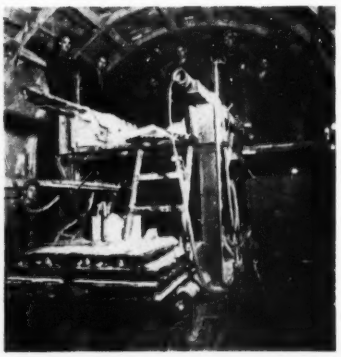
18 and 18-yd. Heilner Scrapers 50-yd. Heilner Bottom Dump Wagon 4, 9, 11 and 16-yd. Tractor Mount Scrapers Cable Power Control Units

STRONG · DURABLE KINKPROOF . . . *for Maximum Service and Safety*

A GOODALL
"Standard of Quality"
PRODUCT

"ALLGOOD CORD"
Manifold and Caisson AIR HOSE

A super hose in every respect, built for two important fields of service . . . manifold lines to jumbos, wagon drills and drifters, where its extra strength and durability assure steady power to the drilling tools; and "life" lines to caissons, where its tough, kinkproof construction precludes the risk of failure in the air supply.



The tube, carcass and cover of "Allgood Cord" are combined to form a hose structure which will withstand high pressures constantly applied; continual dragging over rough surfaces; and blows inflicted by falling rock, tools and timbers. Made in 1½" to 4" sizes, in maximum lengths of 50 feet. *Contact our nearest branch for details.*

PARTICIPATING IN THE MANAGEMENT AND FINANCING OF KENTUCKY SYNTHETIC RUBBER CORPORATION

GOODALL RUBBER COMPANY

GENERAL OFFICES, MILLS and EXPORT DIVISION, TRENTON, N. J.

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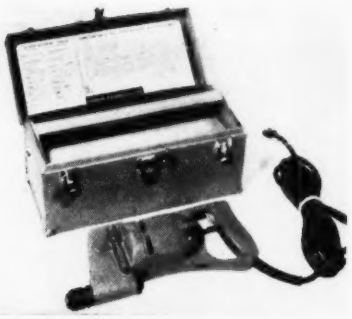
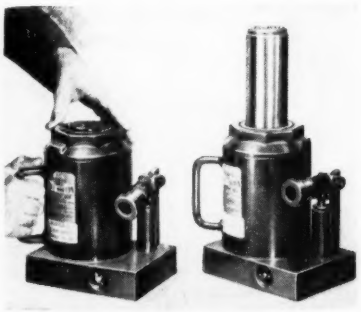
Est. 1870



ELECTRIC HAMMER—The Super-Slugger electric hammer now uses new-type neoprene blocks to give snap to each of the 3,000 blows per min it delivers. Due to the resiliency of the neoprene blocks the normal ⅝-in. piston travel is increased to 1⅛ in. at full speed. Six new holding chucks and a number of new tools broaden the line of hand-forged tools for a wider variety of work. It weighs only 7½ lb.—**Tempo Products Co., 2075 E. 65th St., Cleveland 3, Ohio**

MOTOR GRADER ATTACHMENT—Engineered to eliminate expensive road re-shaping by hand, the Grade-More Slope Grader cuts slopes and shoulder lines, in one operation, while the motor grader stays on top of the road. The 16-ft mold board is suspended from the side of the motor grader and down the slope to cut the road slope to any desired degree. The mold board is controlled from the operator's seat through the mechanical linkage with the regular motor grader controls. It will fit on Caterpillar, Allis-Chalmers and Adams motor graders.—**Hasselbalch Fintzell Co., 215 N. 12th St., Omaha, Neb.**



THIRTY-FIVE TON HYDRAULIC JACK—A new 35-ton hydraulic jack, said to be the first of its kind in the industry, is now in production. Outstanding feature of the jack is an automatic air vent which eliminates 90% of air lock difficulty. Weight of only 55 lb is possible because patented vent design permits using smaller reservoir making possible smaller, lighter base. The jack is 9.7 in. high closed and has raise of 6 in.—**Duff-Norton Mfg. Co., Pittsburgh, Pa.**

A Traylor Jaw Crusher on the job site puts you in complete control of your aggregate supply. You control the source . . . the delivery . . . the quality . . . *and the cost* of job-produced aggregate. Original Traylor features . . . curved jaw plates . . . heavy-duty construction . . . more efficient application of power . . .add up to greatly reduced operating costs for longer periods of maintenance-free operation. Get full information on a Jaw Crusher "Traylor-Made" to control your aggregate costs.
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TYPE H AND HB JAW CRUSHERS

TRAYLOR ENGINEERING & MANUFACTURING CO.
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Tell me how I can control my costs on job-produced aggregate. Send me Bulletin 4105.

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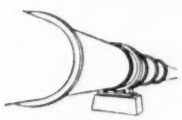
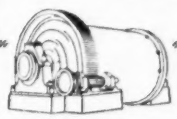
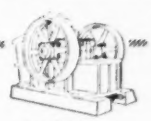
Canadian Mfrs: Canadian Vickers, Ltd., Montreal, P.Q.

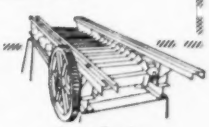
Primary Gyratory Crushers


Rotary Kilns

Secondary Gyratory Crushers

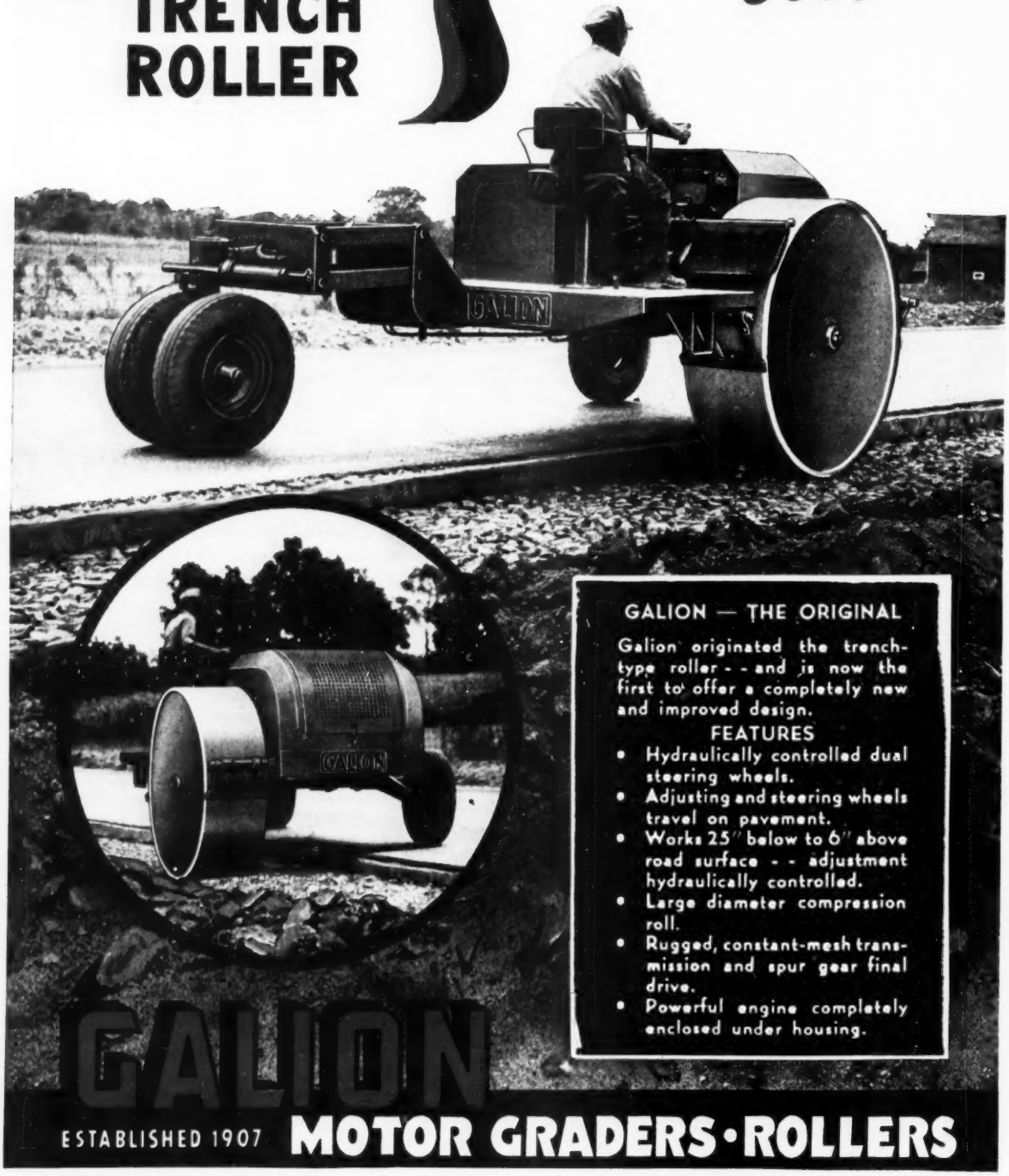

Ball Mills


Jaw Crushers


Apron Feeders

GALION TRENCH ROLLER

SIMPLIFIES ROAD WIDENING JOBS



GALION — THE ORIGINAL

Galion originated the trench-type roller - - and is now the first to offer a completely new and improved design.

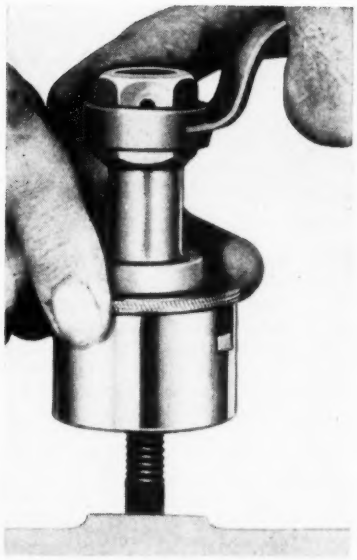
FEATURES

- Hydraulically controlled dual steering wheels.
- Adjusting and steering wheels travel on pavement.
- Works 25" below to 6" above road surface - - adjustment hydraulically controlled.
- Large diameter compression roll.
- Rugged, constant-mesh transmission and spur gear final drive.
- Powerful engine completely enclosed under housing.

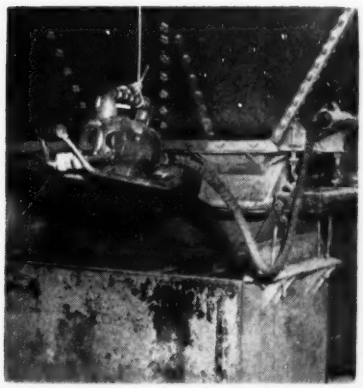
GALION

ESTABLISHED 1907 **MOTOR GRADERS · ROLLERS**

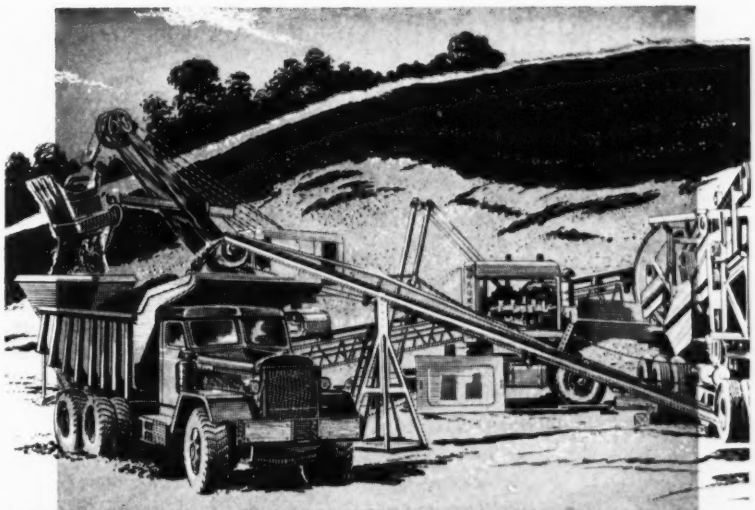
THE GALION IRON WORKS & MFG. CO., General and Export Offices — Galion, Ohio, U. S. A.
Cable address: GALIONIRON, Galion, Ohio



STUD WRENCH — A stud wrench with ratchet action built in, for industrial applications, is said to combine large capacity, speed and positive operation with economy. The self-contained tool in two sizes handles any O D from ¼ in. through ¾ in., regardless of contour. Milled steel jaw teeth bite with progressive power for either right or left turns. Stud will either twist off or turn before jaws slip. Studs are released instantly with an easy turn of a knurled collar. An advantage of this stud wrench is the absence of collets to hunt before pulling a particular stud.—**Clark-Feather Mfg. Co., Fort Morgan, Colo.**



VIBRATOR FOR CONCRETE HOPPERS—Concrete manufacturers and others who store concrete in bins can now employ a Stow electric concrete vibrator to prevent cement from arching over on the inside of the cement hoppers. A Stow 2-hp BU concrete vibrator is suspended from a pulley for ease of moving, and the vibrator head is slipped into a pipe with a ½-in. wall. Pipes are located in different points in the hopper so that the vibration can be concentrated where it is needed.—**Stow Mfg. Co., Binghamton, N. Y.**



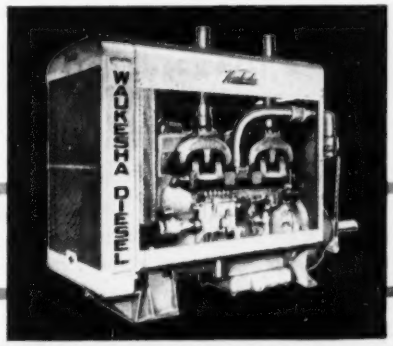
WAUKESHA

1197 cu. in. 6-WAK Series POWER UNITS

WAKU	**Medium Speed, Gasoline**	**206 hp at 1500**
WAKBU	**High Speed, Gasoline**	**255 hp at 1800**
WAKDU	**Normal Diesel**	**212 hp at 1800**
WAKDSU	**Supercharged Diesel**	**325 hp at 1800**

Standard or Counterbalanced Crankshafts

● Super duty! That's what the 6-WAK power units are for . . . and what they do. Here's what they have—every detail built for rough and tumble service . . . crankcase-cylinder block is a deep, thick-wall casting . . . massive, drop-forged, 7-bearing hardened crankshaft . . . pressured oil to every internal bearing, gear, and shaft . . . dual spring overhead valves with Stellite seats . . . cam ground, heavy-duty pistons . . . full-length water jacket, with removable liners . . . and other modern features—for clean burning, high economy, lively performance and long life. Send for Bulletins.



6-WAKDU DIESEL UNIT
6-cylinder, 6¼-in. bore x 6½-in. stroke, 1197 cu. in. displacement.

216

WAUKESHA MOTOR COMPANY, WAUKESHA, WIS.
NEW YORK • TULSA • LOS ANGELES

STURDILITE

Rubber Mounted Base—
Standard Model

HEAVY DUTY FLOOD LAMPS

For Better Light—Longer Service—Lower Cost

Especially Designed for Efficient Service on Shovels, Excavators, Drag-Lines, Roadbuilding Equipment — Locomotive Cranes, Tractors . . .

STURDILITE Heavy-Duty Flood Lamps provide specially high light intensity and spread, heavily constructed for years of trouble-free service. Hermetically sealed-beam lamp—no reflector to tarnish. Spring-mounted socket. Complete assembly mounted on rubber cushioned base to absorb vibration and shocks. Available in 6-8, 12-16, 24-28 and 110-120 voltages.

***Portable* STURDILITE**

New model for inside or outside use. Equipped with convenient carrying handle and substantial pedestal base. Spring-mounted light socket. 4-ft. cord and connector. For all voltages. Weighs only 12 lbs.

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Specifications, Quantity Prices

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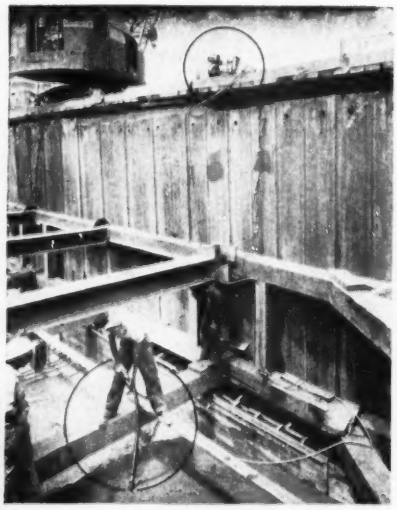
The Tough Jobs-

CALL FOR

Maginniss HI-LECTRIC

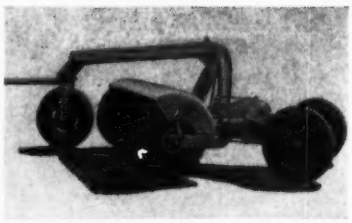


CONCRETE VIBRATORS

This is a real glutton for concrete placement jobs. The Maginniss keeps the concrete rolling fast, your operators fresh and alert, production and profits up. It is one man operated, has no flexible shafts. Electric motor is in the vibrator head.

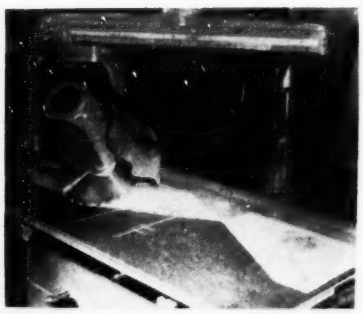
Write and get complete information today.

Maginniss POWER TOOL CO.
MANSFIELD, OHIO



NEW SWEEPER—A new traction-driven sweeper, suited for highways, streets, alleys, airports, parking areas and other similar applications is towed by a tractor or truck. An all welded 5-in. tubular and steel frame forms a rigid backbone for the entire assembly. The brush frame itself is heavy 3½-in. tubular member, with heavily reinforced end plates. A 96-in. brush turns on anti-friction bearings and can be operated at a 30-deg angle, right or left. The brush may be raised and lowered by hydraulic power. Two brush speeds are provided through the two speed transmission with ratchet drive through the rear wheels.—**The Meili-Blumberg Corp., New Holstein, Wis.**

NEW AIR HOIST—An air hoist capable of lifting 1,000 lb at 40 ft per min, yet weighing only 28½ lb, is now available. Called the Aro, Model 7700, the unit is claimed to be over 2½ times faster than other comparable air or electric hoists. A vane-type motor is totally enclosed and is unaffected in ordinary operation by dirt, fumes or heat. It is said the motor will not burn out even if stalled indefinitely.—**The Aro Equipment Corp., Bryan, Ohio**

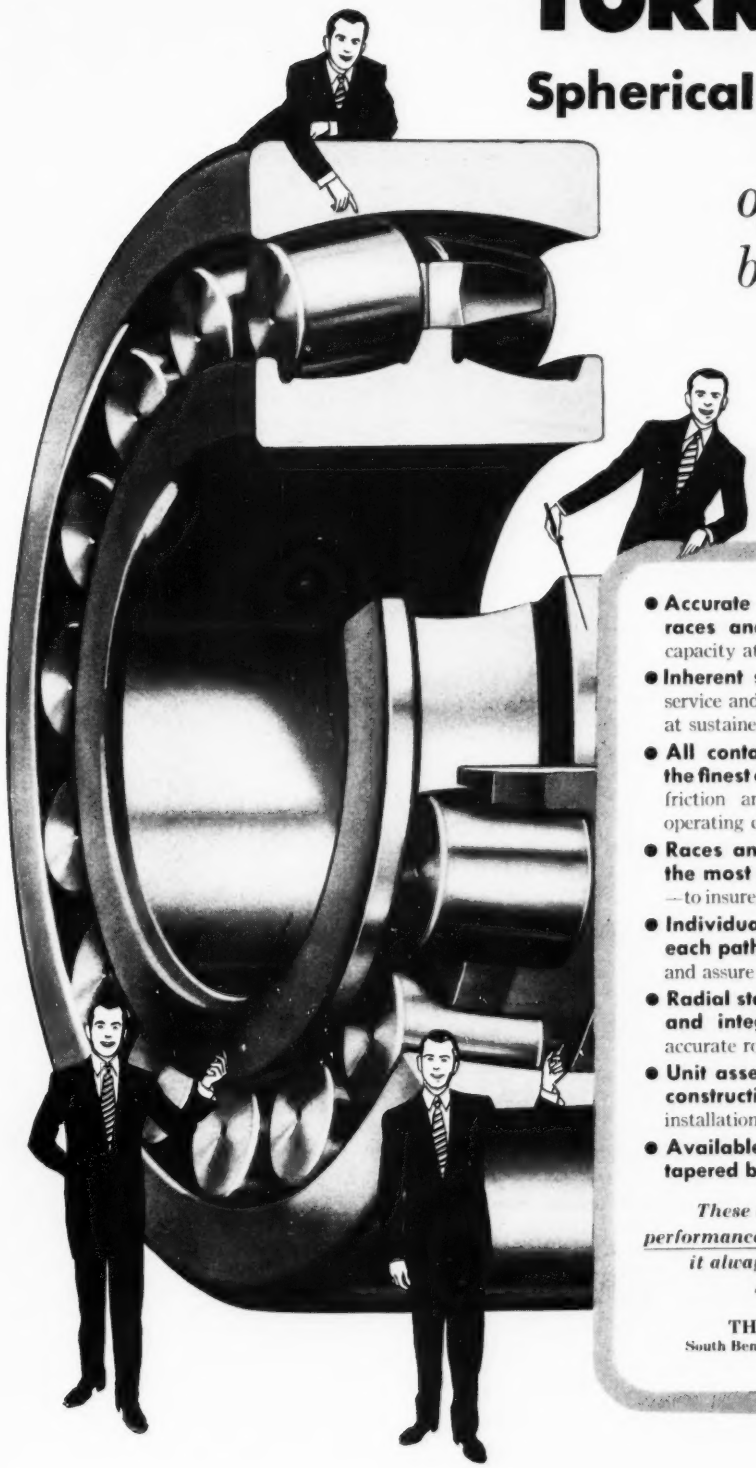


CARBIDE-TIPPED BLADES — A new line of low-cost, carbide-tipped saw blades designed especially for use on radial saws greatly increases the utility and scope of these saws for contractors and builders. The new blades will last almost 100 times as long as standard blades, according to the manufacturer, and are ideal for re-working grit-covered concrete forms and other operations on abrasive materials. The blades are offered in 10-, 12-, and 14-in. dia. to fit standard arbors, and in 24, 30 and 36 tooth-types.—**Delta Power Tool Div., Rockwell Mfg. Co., 400 N. Lexington Ave., Pittsburgh 8, Pa.**

TORRINGTON

Spherical Roller Bearings

offer you these basic advantages!



- **Accurate geometrical conformity between races and rollers**—for maximum load bearing capacity at all times.
- **Inherent self-aligning feature**—for continuous service and free-rolling even under shock loads and at sustained speeds.
- **All contact surfaces precision ground from the finest of bearing quality steels**—for minimum friction and maximum life under the toughest operating conditions.
- **Races and rollers heat treated according to the most advanced metallurgical procedures**—to insure uniform hardness in all load-bearing parts.
- **Individual one-piece cast-bronze cage for each path of rollers**—to eliminate roller binding and assure freedom of operation.
- **Radial stability provided by land-riding cage and integral flange on inner race**—to give accurate roller guiding.
- **Unit assembly, with sturdy flange and race construction**—for easy, economical handling during installation.
- **Available from stock with either straight or tapered bore**—for shaft or adapter mounting.

These advantages add up to maximum performance for your bearing dollar. That's why it always pays to specify TORRINGTON Spherical Roller Bearings.

THE TORRINGTON COMPANY
South Bend 21, Ind. • Torrington, Conn.

TORRINGTON *SPHERICAL ROLLER* **BEARINGS**

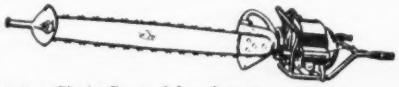
Spherical Roller • Tapered Roller • Cylindrical Roller • Needle • Ball • Needle Rollers

Win one (or two)

Disston Chain Saws plus one (or two) Big Cash Prizes!

Think of it! All you need do is suggest a name for either the Disston DA-211 Chain Saw, or the Disston DO-101 Chain Saw, or both . . . just get your dealer to demonstrate for you . . . then tell in ten words or less why you chose that name—and you stand to win in Disston's great new DOUBLE contest! And look at this DOUBLE list of prizes:

Contest #1



For naming the Disston DA-211 Chain Saw—9 hp, 2-man

1st prize	$500.00 cash and a DA-211 Chain Saw (approx. value: $495.00)
2nd prize	$300.00 cash and a DA-211 Chain Saw
3rd prize	$200.00 cash and a DA-211 Chain Saw
4th prize	$100.00 cash and a DA-211 Chain Saw
5th & 6th prizes	each a DA-211 Chain Saw

Contest #2

For naming the Disston DO-101 Chain Saw—
1- or 2-man, versatile, lightweight

1st prize	$500.00 cash and a DO-101 Chain Saw (approx. value: $322.00)
2nd prize	$300.00 cash and a DO-101 Chain Saw
3rd prize	$200.00 cash and a DO-101 Chain Saw
4th prize	$100.00 cash and a DO-101 Chain Saw
5th & 6th prizes	each a DO-101 Chain Saw

BUT REMEMBER—get your dealer or distributor to help you to enter either or both contests, *you must have official entry blanks.* You can get them FREE, along with contest rules and instructions, from your nearby Disston Chain Saw dealer or distributor. If you don't know his name, write us. Go to your dealer and get your contest entry off this week sure! Contest entries must be postmarked Oct. 31, 1953, or earlier.

DEALERS

Special cash prizes for you, too! Ask your Disston distributor or write us for details.

Entries will be judged by The Reuben H. Donnelley Corporation. Duplicate prizes will be awarded in case of ties.

HENRY DISSTON & SONS, INC.
48 I Tacony, Philadelphia 35, Pa., U. S. A.

NEW SLANT ON DRILLING—One contractor recently had the problem of drilling 20 holes at a 45-deg angle through 18 in. of concrete reinforced with imbedded steel rods so they had built this 45-deg carriage to support the rotary Koncrete Kore drill. The 2½-in. holes were drilled smoothly and on schedule using water to flush cuttings and as a coolant.—**Tilden Tool Mfg. Co., San Clemente, Calif.**

SHOES FOR LADDERS—The Alco-Lite safety shoe for straight and extension ladders has been designed to be used with either the rubber tread or spike on the floor surface. Selling for $4.50 per pair, they are particularly suitable for use around fuels and other volatile fluids.—**Aluminum Ladder Co., Worthington, Pa.**

BUILDER'S CONVEYOR — A conveyor specially designed for contractors and builders comes in two models. The Flare Top has the deeper trough and conveys all building materials except those wider than 16 in. For elevating wider materials the Flat Model is available. By adding 1- or 2-ft boom sections, the 24-ft base machine can be converted into a 32- or 40-ft conveyor. The unit can be moved from place to place on the job by one man, or it can be towed from job to job by a truck. It can be powered with either a gasoline engine or electric motor.—**Fairfield Engineering Co., Barnhart St., Marion, Ohio**

WHY IT PAYS TO BUY STEEL FROM WAREHOUSE

You don't need to invest in expensive cutting equipment !

WHEN YOU BUY STEEL FROM WAREHOUSE YOU GET:

- LOWER INVENTORY COSTS
- LOWER SPACE COSTS
- LOWER TIME COSTS
- LOWER CAPITAL INVESTMENT
- FASTER PRODUCTION
- FEWER INVENTORY LOSSES

TYING up money in large, expensive steel-cutting machinery is something you can avoid, if you wish. Yet you can have your cutting done on the most modern equipment available. When you order your steel from U.S. Steel Supply, specify just how you want it cut. We will meet these specifications exactly. For example, our flame cutting equipment will follow the most complicated patterns without error and turn out finished shapes precisely as you want them. Your U.S. Steel Supply salesman will give you complete information about our cutting services.

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DIVISION

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USS

Warehouses and Sales Offices Coast to Coast

UNITED STATES STEEL

Once is not enough!

The need for blood is greater than ever, not only for men wounded in combat, but here at home . . . to cure disease, to meet accidents and disasters, and to prepare for civil defense.

Our quota can ONLY be met, if those who give *keep on* giving . . . regularly!

You CAN give more than once . . . as often as every three months with complete personal safety. The more often you give the more often you save a life. For every pint of blood you give goes to someone who needs it desperately.

Remember . . . once is NOT enough. Give blood again and again! Call your Red Cross, Armed Forces or Community Blood Donor Center for an appointment to give blood today.

GIVE BLOOD

...give it again and again

BUSINESS EXECUTIVES!

CHECK THESE QUESTIONS

If you can answer "yes" to most of them, you—and your company—are doing a needed job for the National Blood Program.

- ◯ HAVE YOU GIVEN YOUR EMPLOYEES TIME OFF TO MAKE BLOOD DONATIONS?
- ◯ HAS YOUR COMPANY GIVEN ANY RECOGNITION TO DONORS?
- ◯ DO YOU HAVE A BLOOD DONOR HONOR ROLL IN YOUR COMPANY?
- ◯ HAVE YOU ARRANGED TO HAVE A BLOOD-MOBILE MAKE REGULAR VISITS?
- ◯ HAS YOUR MANAGEMENT ENDORSED THE LOCAL BLOOD DONOR PROGRAM?
- ◯ HAVE YOU INFORMED EMPLOYEES OF YOUR COMPANY'S PLAN OF CO-OPERATION?
- ◯ WAS THIS INFORMATION GIVEN THROUGH PLAN BULLETIN OR HOUSE MAGAZINE?
- ◯ HAVE YOU CONDUCTED A DONOR PLEDGE CAMPAIGN IN YOUR COMPANY?
- ◯ HAVE YOU SET UP A LIST OF VOLUNTEERS SO THAT EFFICIENT PLANS CAN BE MADE FOR SCHEDULING DONORS?

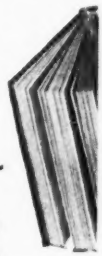
Remember, as long as a **single** pint of blood may mean the difference between life and death for **any** American . . . the need for blood is **urgent!**

NATIONAL BLOOD PROGRAM

Just Out

ESTIMATING CONSTRUCTION COSTS

Here are the practical considerations you need to know to make accurate estimates on engineering projects—the understandable methods and helpful data you need for realistic, sound estimating. Each major type of construction is covered in detail not only on materials, labor, and equipment, but on overhead and profit as well. Over 100 time-saving tables help you make speedy, accurate estimates. **By R. L. Peurifoy, Prof. of Civ. Eng'r'g., A & M College of Texas. 315 pp., 60 illus., 107 tables. $7.50**



SOIL MECHANICS, FOUNDATIONS, AND EARTH STRUCTURES

Covers the theory of soil mechanics, together with the principles and practices of designing and constructing foundations and earth structures indicating the important relationship of these 3 subjects. Emphasizes experimental data and field observation, giving numerous examples of both successful and unsuccessful structures. Covers the estimation of the shearing strength of soils, lateral earth pressures, the effects of plastic flow, sensitivity of various clays to remolding, etc. **By Gregory P. Tschebotarioff, Prof. of Civ. Eng'r'g., Princeton Univ. 655 pages, over 400 illus., $7.50**

WATER SUPPLY AND SEWERAGE

Just Published—3rd Edition!

Presents concisely and authoritatively the essential principles and practices in the design and operation of water and sewage works. Gives latest advances in technical knowledge and practice. Takes up development of water supplies, construction materials, pumps, and water distribution systems. Relating sewerage problems to water supply, it explains design, construction, and maintenance of sanitary, storm, and combined sewerage systems, pollution, and sewage treatment methods. **By Ernest W. Steel, Prof. of Sanitary Engineering, University of Texas. 3rd ed., 582 pages, 241 illus., $8.00**

PLAIN CONCRETE

A sound guide to modern methods in producing and using concrete. Every important phase of concrete technology—from preparing specifications, supervising construction, and testing concrete and concrete materials—is fully covered. Includes best practices in proportioning, making, placing, finishing and curing concrete. **By E. Bauer, Assoc. Prof. of Civil Engr., U. of Ill. Third Edition, 441 pages, $6.50**

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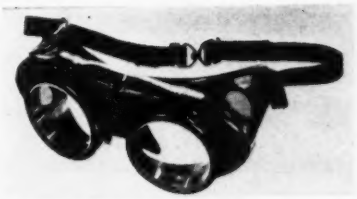
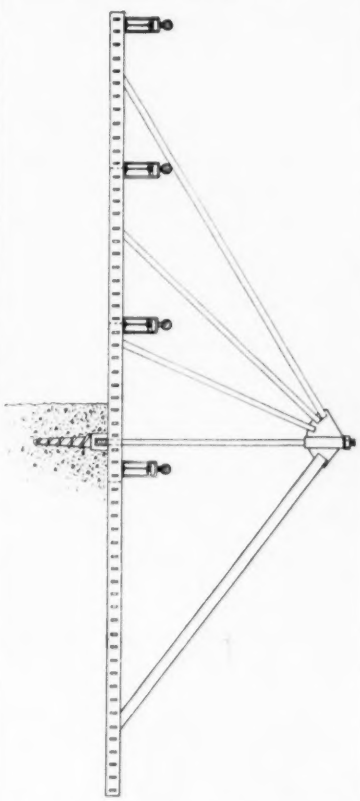
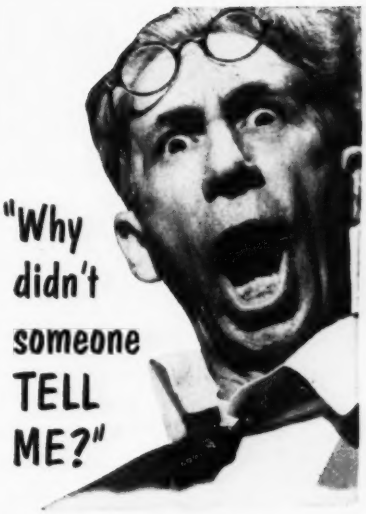


GOGGLE FOR GLASSES—A new goggle, known as Kover-Mor, provides a comfortable fit with ample clearance over modern, large-frame prescription glasses. They come in either a chipping or in welder style. Molded nylon eye cups give lighter weight, toughness, non-flammability and low conductivity of heat. Two-way ventilation is provided through slots in the lens retaining rings and screens in the eye cups.—**Willson Products, Inc., Reading, Pa.**



SHUTTERING (FORMS)—From England comes a method of shuttering for dam construction using a vertical cantilever beam. Called Rapid Metal, there are two types of soldiers which can be used. The first, the normal heavy-duty channel soldier is suitable for concrete pours up to 2 ft. The second, the truss-type channel soldier can be used for pours up to 5 ft. The truss soldier is provided with an adjustable bolt to eliminate small deflections by imposing an equal and opposite deflection before pouring of the concrete. Both soldiers are used in con junction with a patented concrete



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SMITH WELDING EQUIPMENT CORPORATION
Dept. CME-61, 2635 S.E. 4th St., Minneapolis, Minn.

MORE SAND FOR BIG JOBS-ON THE JOB LESS COST

FEATURES:

- *Range 60 to 400 mesh*
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- *20% to 30% greater production*
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- *Cleaner tailings Slow speed. Slow wear.*
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WHY GAYCO GIVES HIGHER PRODUCTION

Get more uniform sand and get it faster with a GAYCO Centrifugal Separator. The ADJUSTABLE centrifugal sizing fan means closer separation and less undesirable oversize—an exclusive GAYCO feature. Yes—all the sand you need, correctly sized, faster, at low cost per ton, with a GAYCO; protected by a Guarantee.

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KINGSTON, N. Y.
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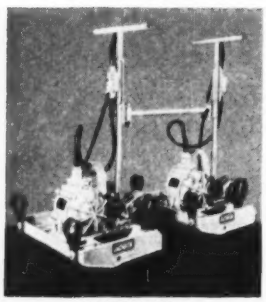
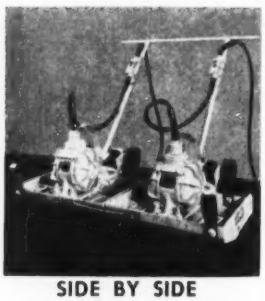
JACKSON
TWIN-COMPACTOR UNITS

SPEED PROGRESS - CUT COSTS!



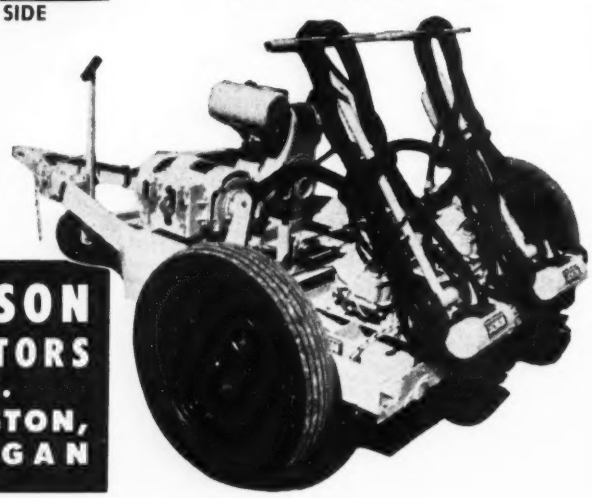
TANDEM



SIDE BY SIDE

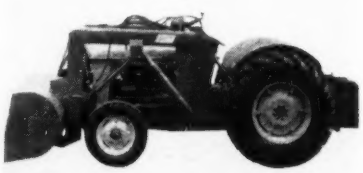
The Jackson Vibratory Compactor, which has proved so exceedingly effective in blacktop pavement widening and patching, paving walks, drives, railway platforms and street crossings, as well as compacting granular soils and crushed rock in sub-bases, bridge approaches etc., is now available in TWIN-UNITS . . . for side-by-side or tandem operation. With either of these twin-unit hook-ups, since they are self-propelling, one operator, in most applications, can readily accomplish twice as much as with a single unit — thus speeding progress and halving labor costs. Compacting upwards of 4,000 sq. ft. per hour of bituminous mix close to maximum density is not at all uncommon. For maximum mobility and time-saving convenience an auto trailer with quick pick-up of the twin-unit and mounting a power plant of more than ample capacity, is also available. The Compactor, either single or twin-unit, can be used with great effectiveness in macadam construction for the odd work not done by the larger equipment. Get the complete facts, at once.

See your JACKSON distributor
or write directly to us.



JACKSON VIBRATORS INC. LUDINGTON, MICHIGAN

anchor screw of cast iron, approximately 12 in. long. This screw has a coarse tapered thread which reduces in depth toward the thinner end. It is drilled and tapped at its thickest end to accommodate the bolt which secures the soldier. The screws are cast in the concrete at the time of pouring and act as an anchorage for the soldiers supporting the next lift of shuttering. They can be removed by a rotary motion. The actual shutter panels are aligned horizontally and are supported by R. S. joists of 4x1¾-in. sections which act as horizontal walers. These panels are clamped to the R.S.J. walers by a patented C-type clamp. The whole unit is capable of being struck and lifted in large sections and forms an extremely rigid and useful shutter for the construction of dams, mass concrete retaining walls and other projects where it is not possible to tie the shutters through from one side of the concrete to the other.— **Rapid Metal Developments, Ltd., 209 Perry Barry, Birmingham, England**



ADDS NEW POWER SHOVEL— The Brady Mfg. Corp. has added a hydraulic power shovel to its line of heavy-duty industrial equipment. The company has arranged to manufacture a detachable version of the Lessman Power Shovel and will call the new model the Lessman Jr. The original Lessman shovel is a complete unit, while the new unit has been adapted to make this shovel unit detachable. This makes it possible to convert a standard Ford or Ferguson tractor to a heavy-duty power shovel at any time. The new unit also employs hydraulic crowder arms for ramming to load the bucket, rather than tractor power. A controlled leverage in the hydraulic arms permits Ford and Ferguson tractors to handle ½- to ¾-yd buckets, depending on the material handled.—**The Brady Mfg. Corp., Des Moines, Iowa**

AUTOMATIC DRILLER — A new Thor one-man operated drilling machine features an integral air-leg feed and automatic air-water backhead. It is equipped with a specially designed 45-lb sinker rock drill and a 2¼-in. dia feed leg, available in either 36-in. or 48-in. length to make it adaptable for all types of drilling at all angles. The drill can be removed from the leg and used as a

(Continued on page 205)

handle the BIG LIFTS in COST CUTTING TIME!

Scores of lifting jobs, light or heavy, can be handled smoothly and efficiently with a Bucyrus-Erie 22-B Transit Crane.

"Full-feel" control lets operator place loads accurately with minimum jockeying. Power controlled lowering for main hoist line plus fully independent power controlled boom lowering speeds work still more, permitting delicate positioning of loads. A friction swing brake (in addition to the regular swing lock) enables operator to spot and hold boom point over a desired position. Special 16-part boom suspension provides slower boom hoisting or lowering for even greater precision in setting steel, etc.

Open-throated boom construction permits rigging 2, 3, or 4 parts of line without removing sheave guards. Even with high boom angles, lines can pass freely behind sheaves. Jib extensions in 10-, 20- or 30-foot lengths, available for special high lift crane service, can be added without removing sheaves, guards, or suspension ropes from upper end of boom. With special boom folding mechanism, booms over 60 feet can be carried folded on job-to-job moves.

12E53

See your Bucyrus-Erie excavator distributor for complete information.

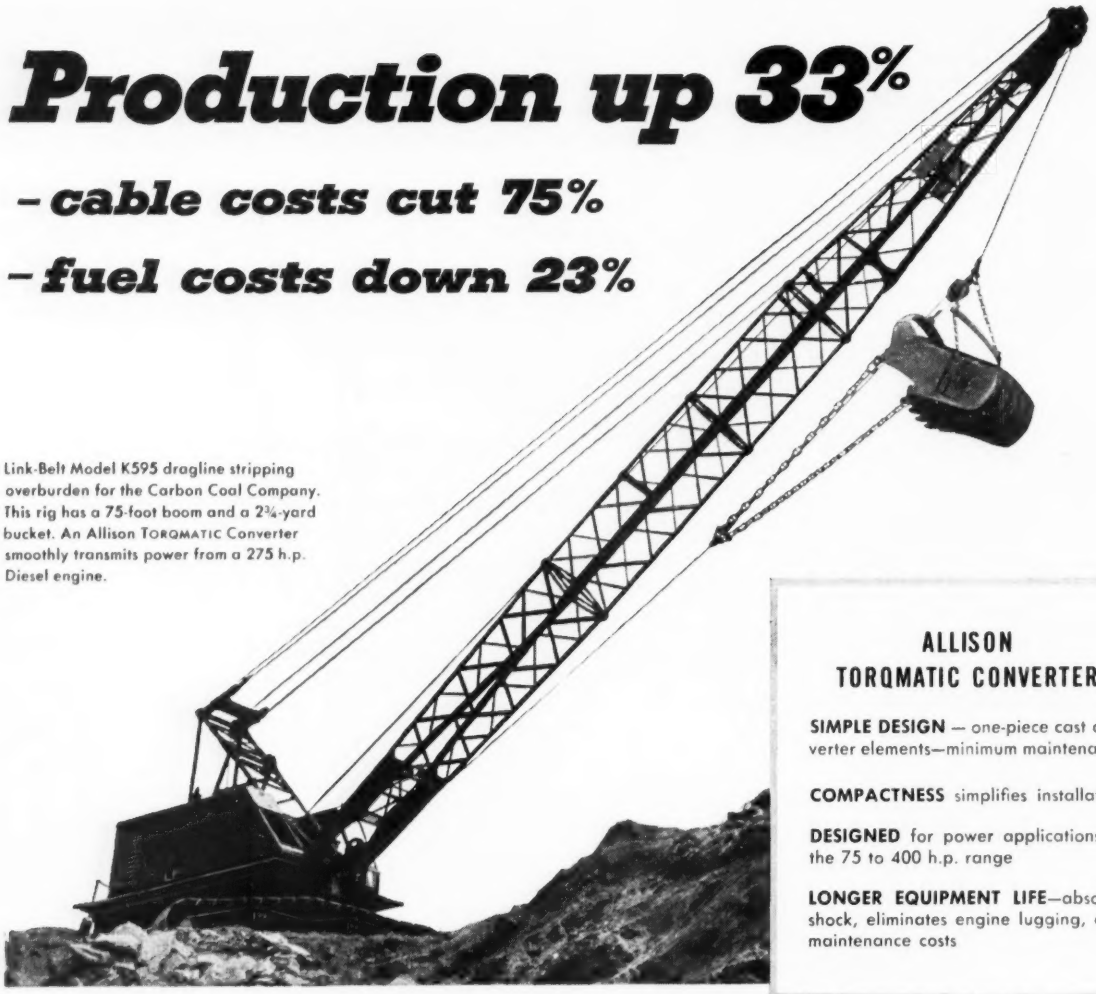
BUCYRUS ERIE

South Milwaukee
Wisconsin

Production up 33%

-cable costs cut 75%

-fuel costs down 23%



Link-Belt Model K595 dragline stripping overburden for the Carbon Coal Company. This rig has a 75-foot boom and a 2¾-yard bucket. An Allison TORQMATIC Converter smoothly transmits power from a 275 h.p. Diesel engine.

ALLISON TORQMATIC CONVERTER

SIMPLE DESIGN — one-piece cast converter elements—minimum maintenance

COMPACTNESS simplifies installation

DESIGNED for power applications in the 75 to 400 h.p. range

LONGER EQUIPMENT LIFE—absorbs shock, eliminates engine lugging, cuts maintenance costs

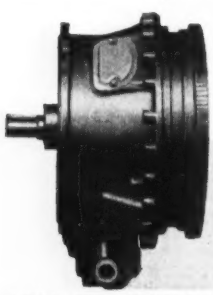
Here's another operator who's boosting production and cutting costs with Allison TORQMATIC DRIVES: The Carbon Coal Company operates two Link-Belt draglines, strip-mining coal near Grove City, Pa. The units are nearly identical—one has an Allison TORQMATIC Converter, the other is direct-driven—but there's a big difference in operating costs and production.

The Allison Converter absorbs shock loads so dragline cable on the TORQMATIC-equipped unit lasts four times as long, *saving $2160 a year on cable alone*, a reduction of 75%.

The TORQMATIC-equipped unit strips a 60x40x25 foot "lift" of overburden in 24 hours against 32 hours for the direct-driven unit, a 33% increase in production. A comparison of daily fuel records shows the friction drive unit consumes 130 gallons while the Converter-equipped unit uses only 100 gallons, a cut in fuel costs of 23%.

The TORQMATIC-equipped unit has rolled up such an impressive performance record that this operator intends to specify TORQMATIC DRIVES in all his new heavy-duty equipment. You, too, can cut your costs by specifying Allison TORQMATIC DRIVES the next time you buy. Ask your equipment dealer, manufacturer or write:

ALLISON DIVISION OF GENERAL MOTORS
Box 894TT, Indianapolis 6, Indiana



Allison **TORQMATIC DRIVES**

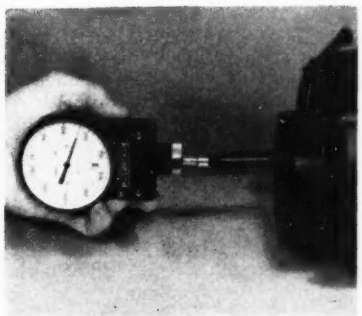
GM GENERAL MOTORS

COMPACT, EFFICIENT HYDRAULIC DRIVES FOR CRANES * TRUCKS * TRACTORS * SCRAPERS * SHOVELS * DRILLING RIGS

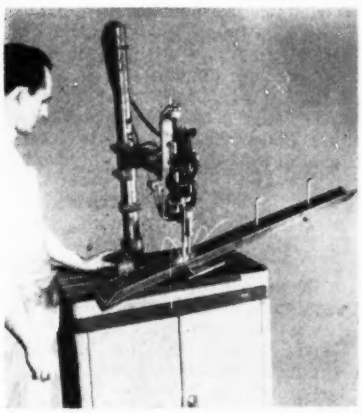
EQUIPMENT NEWS

. . . Continued from page 202

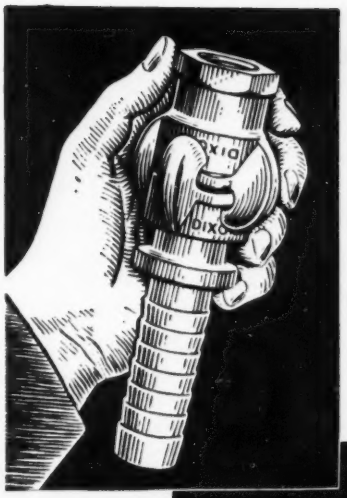
sinker simply by loosening one nut. Other features include, exclusive six-position throttle control, single air hose to supply air to drill and leg; hinge joint between drill and leg; with tension adjustment; convenient, safe location of controls on back-head; aluminum cylinder and piston and weight of only 80 lb.— **Thor Power Tool Co., Aurora, Ill.**



RPM CHECKER—Here's a portable instrument for checking the rpm of motors, machinery and revolving shafts that has a minimum speed of 40 rpm and will go up as high as 50,000 rpm. Operation is very simple. Just press the rubber tip against the revolving shaft. It costs $75.— **Montgomery and Co., Inc., 53 Park Pl., New York 7, N. Y.**

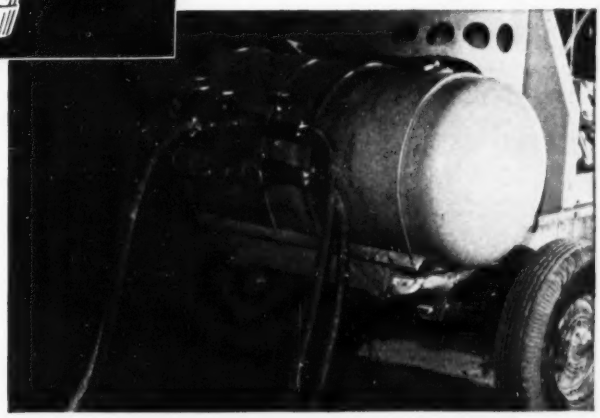


STUD WELDING GUN — Anchor studs ½ in. in dia can be installed in a split-second with the semi-automatic Nelson stud welding gun which operates with equal effectiveness in the angle or on the faces of trench frames, column guards, joists and any other shape. Accurate positioning is maintained by fixtures developed for this purpose, and distortion is completely eliminated. Fabricating shops, where production units are already in operation, are installing anchor studs at rate of 4 to 5 per min. — **Nelson Stud Welding Div., Gregory Industries, Inc., Lorain, Ohio**



THIS *Versatile Coupling*

while used primarily for air-operated tools in field and factory, is equally efficient for water, oil and spray service. Illustration shows hose end and female I.P.T. end connected.



"AIR KING" *Quick-Acting Universal* HOSE COUPLING

The "AIR KING" will reduce operating costs on every job requiring quick connection. Heads are locked by simply pressing together and giving one a quarter-turn. These locking heads are identical for all sizes of hose or threaded ends, permitting the coupling of any two sizes of hose, or hose and pipe, within the "AIR KING" size range. Equipped with patented safety locking device. Available in bronze or rustproofed malleable iron, in sizes up to 1".

Two Hose Ends Connected

Male I.P.T. End

Stocked by Manufacturers and Distributors of Industrial Rubber Products

DIXON *Valve & Coupling Co.*

GENERAL OFFICES & FACTORY—PHILADELPHIA 22, PA. BRANCHES—CHICAGO
BIRMINGHAM • LOS ANGELES • HOUSTON • DIXON VALVE & COUPLING CO., LTD., TORONTO

ASSOCIATE COMPANIES—BUCK IRON COMPANY, INC., QUARRYVILLE, PA. • PRECISION DRAWN STEEL COMPANY, CAMDEN, N.J.

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right to the job
Anywhere
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ENGINE DRIVEN
A.C. ARC WELDER
AND POWER PLANT
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LOW OPERATING COST —
LOW MAINTENANCE COST
—LOW INITIAL COST—DELIVERS A FULL 200 AMPERES—WIL HANDLE A.C. OR A.C.-D.C. ELECTRODES FROM 1/16" TO 3/16" INCLUSIVE.
An arc welder and power plant combined—so compact and easily portable that you can take it right to the job —anywhere. The MILLER Model AEA-200L is a high cycle, high efficiency A.C. generator that gives you all the advantages of A.C. welding.
One KW of auxiliary D.C. power to operate lights and universal power tools available while welding.
It is also an emergency power plant. All standard electrical appliances within the power rating (3 KW, 110/220 volts) can be operated.
Write today for complete details and the name of your nearest MILLER distributor.
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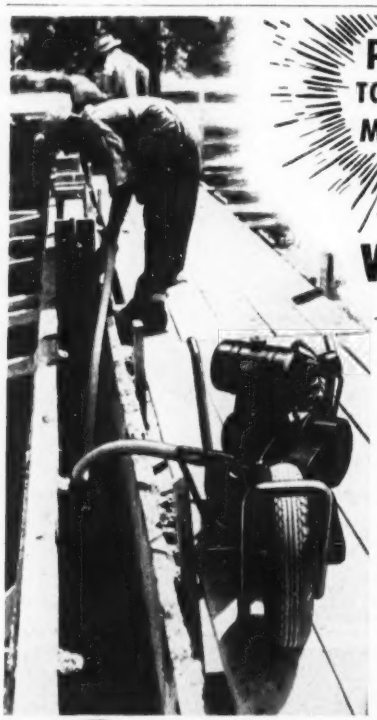
MANUFACTURERS OF A QUALITY WELDER LINE SINCE 1929


POWER
TO FIT THE
MACHINE
POWER
TO FIT THE
JOB
WISCONSIN-Powered
WYCO
VIBRATOR
This Wyco Concrete Vibrator, made by Wyzenbeek & Staff, Inc., Chicago, Ill., is powered by a 4-cycle single cylinder Wisconsin Air-Cooled Engine . . . delivering 7000 to 8000 vibrations per minute, operating through a jackshaft at a 2-to-1 ratio.
Working in stiff concrete mixtures to settle and fill foundation forms without voids or rough, porous spots in the wall calls for dependable, hard-hitting power . . . such as supplied by this Wisconsin Engine. Timken tapered roller bearings at BOTH ends of the crankshaft carry the load and an outside-mounted high tension magneto with impulse coupling provides quick, easy starts in any weather.
For dependable, heavy-duty service and lowest maintenance costs . . . specify Wisconsin Air-Cooled Engines (3 to 36 hp.) for Your equipment.
MOST H.P. PER POUND
WISCONSIN MOTOR CORPORATION
World's Largest Builders of Heavy-Duty Air-Cooled Engines
MILWAUKEE 46, WISCONSIN

New PUBLICATIONS From MANUFACTURERS

The catalogs and bulletins reviewed below will keep you posted on latest developments in construction equipment and materials available for your use.

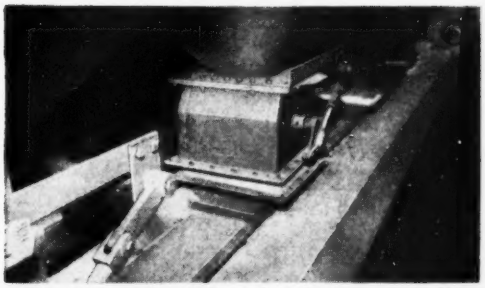
HYDRAULIC PULLER—Industrial maintenance problems involving the removal and installation of gears, bearings, pulleys, sheaves, pinions, shafts, couplings, tubes, etc., by hydraulic power are treated in a new bulletin which covers the use and application of pullers, attachments and adapters for three sizes of hydraulic rams—17½, 30 and 50 ton. The bulletin is available on request. Ask for Power-Twin Bulletin, HY-1953.—**Owatonna Tool Co., 380 Cedar St., Owatonna, Minn.**

CONCRETE GUNNING EQUIPMENT—A 4-p brochure describing and illustrating the new improved models 750 and 1250 Bondactors, concrete gunning equipment, is now available. It contains a detailed explanation of the gunned or air-placed concrete and aggregate principle and gives recommended uses in the construction, repair and maintenance fields.—**Air Placement Equipment Co., 1011 W. 24th St., Kansas City 8, Mo.**

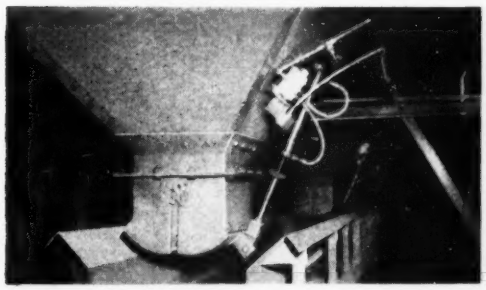
WIRE ROPE FITTINGS—Sauerman Bros., Inc., manufacturers of scrapers and cableway excavators, have made available a new 6-p brochure for users of wire rope fittings. It contains blueprint drawings, tables and ordering information on open and double-wedge sockets, pins and continuous cable clamps. It also contains photos of the fittings in various field work and illustrates other applications.—**Sauerman Bros., Inc. Dept C-32, 522 S. Clinton St., Chicago 7, Ill.**

BLASTING MOVIE — A 15-min, 16mm sound film, involving unusual photographic techniques, shows how modern methods making blasting, once an instantaneous operation, an orderly and controlled sequence of events almost precisely adaptable to the type of rock, the surroundings and the specific result desired. It explains the principles of blast detonation, and discusses the practice of millisecond delay blasting, and also the new refinement of the technique known as alternate velocity loading. The film titled, The Inside Story is available for showing before mining, quarrying and construction engineers. Prints of this movie can be obtained from **Atlas Powder Co.**, with offices in **Wilmington, Del.; New York; Tamaqua, Pa., Pittsburgh, Pa.; Knoxville, Tenn.; Chicago, Ill.; Joplin, Mo.; San Francisco, Calif.; and Seattle, Wash.**

ANOTHER LEVITTOWN and ANOTHER HELTZEL



Heltzel patented tubular valve eliminates jamming, has pin-point accuracy.



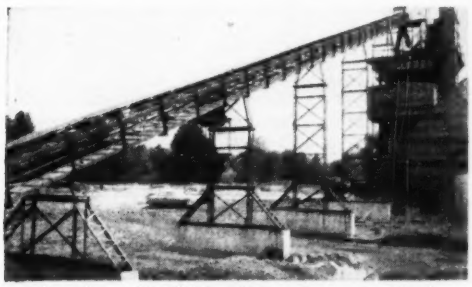
Double clamshell remote control aggregate gate adjustable to control speed.

Levitt's third Heltzel plant promises new concrete batching records for leading city builder.

famous city builder sets third HELTZEL plant into operation at fabulous Bucks County development

Down in Bucks County, Pennsylvania, William J. Levitt, head of the city building firm that bears his name, recently set into operation his third Heltzel concrete batching plant. The fact that his two previous Heltzel plants set record-smashing production records convinced him of Heltzel's ability to produce.

In fact, the first plant played a big part in helping him astound the construction world with his Long Island Levittown. It batched concrete on an average of 1800 cubic yards per day, and on occasion rang up amazing 2,000 yard plus days. His second Heltzel plant was used mainly in the construction of concrete blocks, and untiringly kept pace with the fastest concrete block production on record.



Clean line, all-welded A-frame comes completely assembled, easy to erect.

This new Heltzel plant promises even greater things. It's completely integrated—from supply hoppers to conveying equipment to automatic batcher—it's completely designed and built by Heltzel to give Levitt the nation's most efficient concrete batching. Its capacity is an astonishing 300 cubic yards per hour, it's fully automatic with high speed electronic batching that is accurate to the fraction of a pound; the entire operation is controlled from a central control area, and it bristles with many other new Heltzel exclusives that put an end to guesswork and human error in concrete batching.

Portable or stationary, large or small—if you want the finest in modern batching equipment get the Heltzel story before you buy. Heltzel engineers will be happy to work with you in developing just the plant you need for your operations.

The Heltzel Steel Form and Iron Co., Warren, Ohio

Another New Heltzel Installation

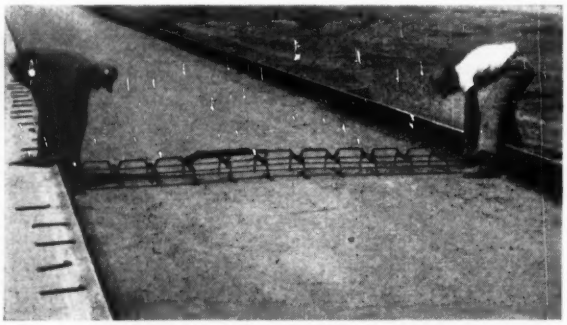
New Idlewild Taxiway Carries Lots of Weight

New taxiway at Idlewild is designed to carry heavy planes like this BOAC Stratocruiser. The taxiway is 6000 ft long and 100 ft wide

Giant superliners, bound for points overseas, are now using new taxiway T27 at New York International Airport, at Idlewild. This mile-long strip, containing more than 23,000 cu yds of concrete, is 13 in. thick and supports a 300,000-lb plane equipped with two sets of dual wheels.

Located at the south end of Idlewild, taxiway T27 was designed to carry heavy Constellations, Stratocruisers and other big planes between international runways and the loading stations. Bethlehem Dowel Units, of the same type that were selected for the original runways and taxiways at Idlewild, were used in the construction of this new taxiway.

Minimizing load-transfer problems caused by heavy wheel loads, Bethlehem Dowel Units transfer the weight of the plane from one side of the joint to the other, while offering minimum restraint to the movement of the slab due to expansion or contraction. The units hold the dowels in accurate alignment at all times, permitting free dowel movement in the concrete.



Bethlehem Dowel Units minimize load-transfer and expansion-contraction problems.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

★ BETHLEHEM STEEL ★

BETHLEHEM REINFORCING STEELS

HOW TO DISCOVER HIDDEN FLAWS—Turco has just released an interesting booklet that shows the many applications of Turco Dy-Chek, a portable inspection method and Turco Chek-Spek, its high speed partner for use on production lines. The process involving surface-active chemistry gives simple, economical methods for discovering dangerous, hidden flaws.—**Turco Products, Inc., Los Angeles, Calif.**

HARDFACING PROCEDURE SHEETS—For added service life of equipment parts, Amsco is offering hardfacing welding procedure sheet to the construction industry, detailing the application, correct rod and amount needed and the procedure for hardfacing. Sheets are available on jet pump drill, post hole augers, root plow, tractor drive sprockets, tractor rails, and diesel engine valves.—**American Manganese Steel Div., 389 E. 14th St., Chicago Heights, Ill.**

DANGERS UNDER PRESSURE—A brand new safety booklet, called Danger Under Pressure, was prepared solely for the benefit of all hose users to aid them in securing longer service from both hose and hose couplings. It was also written to help avoid serious or fatal accidents. The booklet claims that many hose users do not fully realize that air, gas or steam are dangerous to handle. It calls attention to the fact that a hot ember burning through welding hose lines can and does cause terrific explosions and fires. It also cites that improper attaching of couplings to hose or mis-application are frequent causes of serious accidents or costly delays and interruptions.—**Hose Accessories Co, 2700 N. 17th St., Philadelphia 32, Pa.**

ROCK DRILL BITS—A 24-p booklet describing a number of bits from the rock drill family can be obtained from **Brunner & Lay, Inc., 9300 King St., Franklin Park, Ill.**

ROAD WIDENER—The proper application and use of the Domor Road Widener is explained in a new 4-p folder just released. The road widener is a quick-change attachment mounted to any motor grader.—**Ulrich Road Machinery Co., Cleveland, Ohio**

POWDER-ACTUATED FASTENERS—One of the leading makers of powder-actuated tools and fasteners has just published a 32-p application manual that is one of the most complete ever published. The booklet contains photographs and cutaway sketches that show precisely how powder-actuated tools and fasteners are employed in various installations in building, construction and maintenance fields, as well as in electrical, air-conditioning, plumbing, masonry and other crafts.—**Ramset Division of Olin Industries, Inc., 12117 Berea Rd., Cleveland 11, Ohio**

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makes the difference

*P. M. = Pressure Metering

Applying bitumen through 2 feet of spraybar as shown may not appear unusual or different, but when the operator can use any length—from 1 to 24 feet—*without changing the pressure* and *without any application adjustment whatever* . . . then there's a difference. It's *Rosco's Pressure Metering Method* that makes that difference.

The P. M. method of applying bitumen is *not* metered by the bituminous pump, nor is the amount of discharge measured in relation to the pump revolutions. Normal wear of the pump and occasional, unavoidable nozzle clogging never affect the application rate. Here again, Pressure Metering *makes the difference* . . . the rate is automatically maintained by Rosco's P. M. system.

It is this Pressure Metering Master Valve, the "heart" of Rosco Distributors, that gives you this built-in control of pressure which is the only accurate method of obtaining precise bituminous application. This is the valve that also directs the flow of material for all of the Rosco Distributor functions.

Make the difference pay off. Let your Rosco dealer show you how. Write the factory for descriptive bulletins with specifications of Distributors with P. M.

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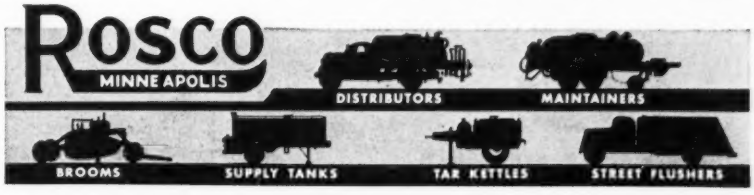


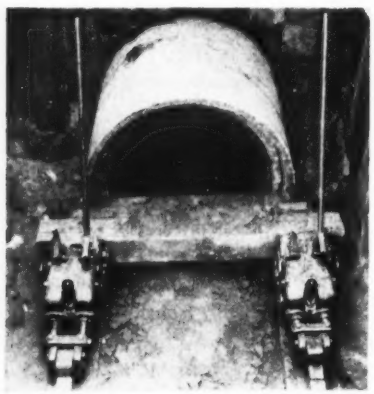
FAST, EASY WAY

TO INSTALL PIPE...

AT LOWER COST

PUSH PIPE UNDERGROUND WITH A GREENLEE HYDRAULIC PUSHER

Here's the simple, cost-cutting way to install underground pipe. Speed your jobs with a GREENLEE Pusher. One-man-operated, portable, simple to operate. No tearing up of pavement . . . eliminates extensive ditching, tunneling, backfilling, tamping, repaving. Cuts job time to a fraction. GREENLEE Hydraulic Pipe Pusher often pays for itself on first job. Two sizes — model shown above for pushing 3/4" to 4" pipe. Larger unit, below, for pipe over 4", concrete sewer pipe and large drainage ducts. Power pump (as shown above) also available for extra case and speed of operation.



GREENLEE

Write today for descriptive literature. Greenlee Tool Co., 2189 Columbia Avenue, Rockford, Illinois, U.S.A.

INDUSTRIAL BELTING—Designed principally for engineers, a new 48-p technical manual on transmission, conveyor and elevator beltings is divided into three major divisions and contains general information covering every aspect of each belting. Information data is handled in question-and-answer style in simple lay language, making it a good reference book for the non-engineering group. You can have this technical data manual free by writing on your business stationery to **Boston Woven Hose & Rubber Co., P. O. Box 1071, Boston 3, Mass.**

SOILTEST—A 75-p booklet showing the complete line of physical testing apparatus for soils, asphalt, concrete and other materials is available from **Soiltest, Inc., 4522 W. North Ave., Chicago 39, Ill.**

PAVING BREAKERS—The right paving breaker for every job is the theme of a new catalog. It gives the story of breakers from 15 lb up to 146 lb. For copies of this interesting bulletin write **Ingersoll-Rand Co., Dept RD, 11 Broadway, New York, N. Y.**

CASTERS AND WHEELS—The complete line of casters and wheels is featured in a new illustrated brochure just released. It stresses the company's innovation in caster design, the Lockweld caster with a king-pin. Single and double ball race swivel casters incorporating this unique construction are detailed in photos and description. This bulletin can be obtained free.—**Fairbanks Co., 393 Lafayette St., New York 3, N. Y.**

ROLLERS—A new line of C Model tandem rollers is described in a 12-p booklet just issued. The new pamphlet describes the unusual features of tandems from 5 to 16 tons.—**Buffalo-Springfield Roller Co., Springfield, Ohio**

CORE BARREL INFORMATION—If you have anything to do with diamond core drilling you will be interested in a new bulletin issued recently regarding the Series M Core Barrel. The bulletin explains how the core barrel permits securing a higher percentage of good core from fractured, porous, or soft formations. Ask for Bulletin 330 from **Sprague & Henwood, Inc., Scranton 2, Pa.**

TRENCHER—A 2-color, 8-p catalog-type bulletin on the Cleveland Model 110 trencher has been recently released. This machine, accepted in the trade as a rugged, compact, highly productive trencher, can dig openings from 12 to 24 in. wide and up to 5½ ft deep. The booklet contains a good selection of photographs showing all types of trenching jobs. It's free.—**Cleveland Trencher Co., 20100 St. Clair Ave., Cleveland, Ohio**

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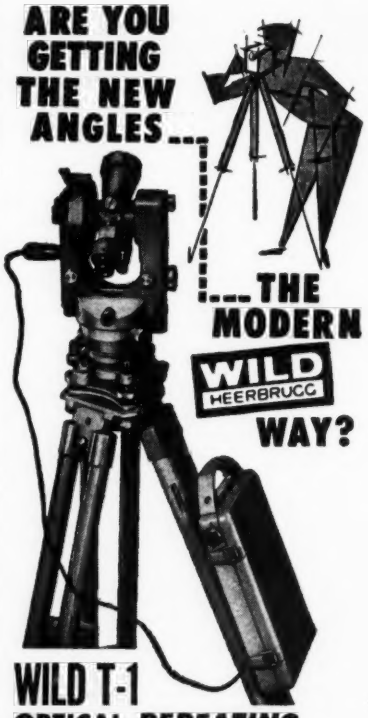
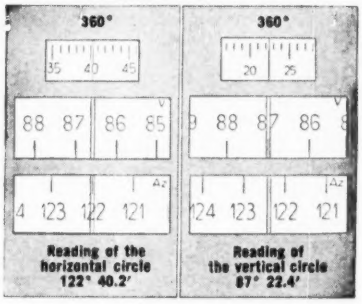


...THE MODERN WILD HEERBRUGG WAY?

WILD T-1

OPTICAL *REPEATING* TRANSIT Rugged, compact design . . . with 20 years of proven service under tough field conditions.

Both circles read from one single station through microscope alongside telescope eyepiece. Optical micrometer eliminates possibility of reading error. Illumination is provided by daylight mirror or by battery attachment for night, underground or mine work.



WILD surveying instruments, inherently accurate, are Swiss precision designed for stability under adverse conditions, for sturdiness, and for ease in operation . . . they provide lasting trouble-free service.

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Extensive repair and servicing facilities by factory trained specialists.

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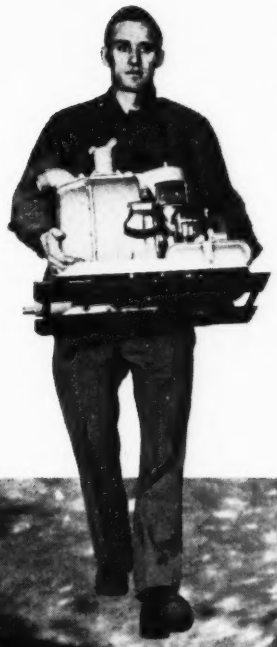

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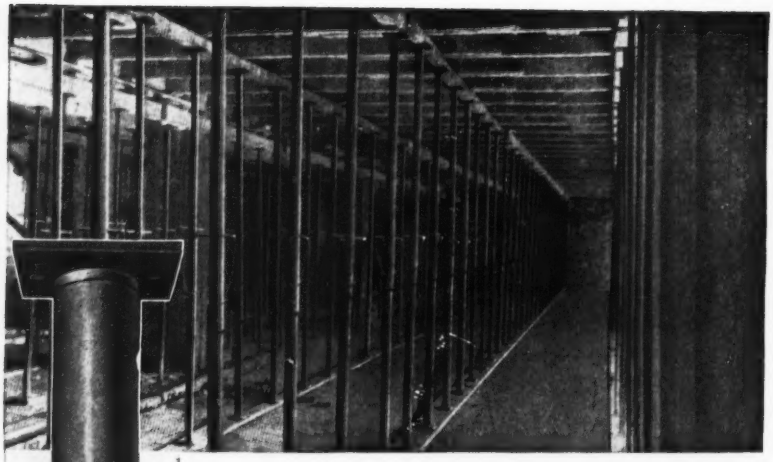

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ADJUSTABLE SHORES
with the ONLY
COMPLETELY ENCLOSED
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1 Completely encased Adjusting Screw, protected from sand, grit and concrete at ALL TIMES for smoother action . . . completely protected from weather to prevent ruts and corrosion . . . protected from damage in transit and storage.

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4 No projections anywhere . . . streamlined for greater safety to workmen and to shorten expensive Setting-up and Taking-down time.

It will pay every contractor to replace out-moded shoring equipment with the New MARVEL Adjustable Prop with *"Premium Performance"* because only the New MARVEL has the *Completely Encased* Adjusting Screw built for Life Time Service.

Order Now . . . while prompt deliveries are available.

Available in three sizes . . . Maximum Adjustment to 15 feet.

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BUILDERS OF ADJUSTABLE SCAFFOLDS SINCE 1939

ROOFING BOOKLET—Available for free distribution is a 4-p brochure entitled, Picture Story of the History of Built-Up Roofing Performance With Liquid Foils. It contains photos showing condition of roofing after years of weathering and illustrates the value of a new form of roofing protection.—**Grems Manufacturing Co., Klamath Falls, Ore.**

PRESTRESSED CONCRETE FITTINGS AND STRANDS—Roebling's new catalog on Strands and Fittings for Prestressed Concrete is the second edition, and it is claimed to be the only material on this subject in existence. You can get it from **John A. Roebling's Sons Corp., Trenton 2, N. J.**

ASPHALT PLANT MOVIE—The story of asphalt drying, gradation and mixing equipment, as related to the Model 840 asphalt line of Barber-Greene, is told in a new movie in sound and color. It's available in either English or Spanish.—**Barber-Greene Co., Aurora, Ill.**

REQUIREMENTS FOR VERMICULITE PRODUCTS—Vermiculite Institute of Chicago has just issued a 16-p booklet which presents recommendations covering proper requirements for vermiculite products. Building code language and several pages of line drawings make this a convenient reference for officials and agencies responsible for approval of materials and construction or for the writing or revision of building codes. The booklet should be of interest also to fire insurance rating bureaus, since it covers the fire resistance of combustible and incombustible constructions protected with vermiculite products.—**Vermiculite Institute, 208 S. LaSalle St., Chicago 4, Ill.**

VIBRATING SCREENS—Complete information on Deister heavy-duty types ETP (end-tension, pillow block) and EUT (end-tension, unitized) high-speed vibrating screens has been released. The bulletin, called No. 55, lists performance characteristics, the exclusive elliptical throw, illustrates how material movement is controlled for greater speed and efficiency. The full range of sizes with various motor mounts are also shown. The booklet is free. —**Deister Machine Co., 1933 E. Wayne St., Fort Wayne 4, Ind.**

WHERE TO BUY

STOP that WATER

With FORMULA NO. 640, a clear liquid which penetrates 1" plus in concrete, brick, stucco, plaster, etc. Seals out water, dirt. Holds 20' head. Use outside and in. Preserves all absorbent materials. Sold 14 years. Quick, economical, sure. $3 in 55's. Free sample. See Sweet's.
HAYNES PRODUCTS CO., OMAHA 3, NEBR.

GIVING CONCRETE **THE SHAKES** AT 10,000 V.P.M.

Here's a close-up of the pneumatic CP-325 being used on a reinforced concrete job. It's ideal for walls, columns and heavy floor and roof slabs.

The high frequency electric CP-220 Vibrator can be used anywhere within a 400 foot radius . . . and the generator doesn't have to be moved from spot to spot.

The one-man pneumatic CP-417 Vibrator really does a job on mass concrete. Places batches up to two cubic yards on dams and bridge piers.

WHATEVER YOUR vibrating needs there's a CP Vibrator suited to your specific requirements. Seven different models of CP Pneumatic and High Frequency Electric Vibrators are available in one and two-man types—and in frequency ranges to 10,000 V.P.M. They're designed for rugged, heavy duty. Direct connected motors eliminate need for flexible shafting. Pneumatic and electric motors are interchangeable. For more information write *Chicago Pneumatic Tool Company, 8 East 44th Street, New York 17, New York.*

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PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES • ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

Setting a New Republic on a Firm Foundation

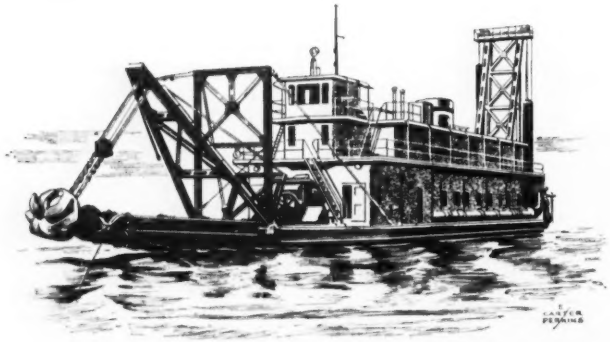
Nine American-made Ellicott Hydraulic Dredges, with four more on order, are doing just that for the young island Republic of Indonesia! Ranging in size from the small 8" Dragon to the giant 22" "Musi," they're filling land to support the weight of factories and warehouses . . . filling lowlands to eliminate mosquitoes . . . draining enough new agricultural land to feed millions of Indonesians.

And they're getting the fill from still other Ellicott dredging operations . . . enlarging river channels for heavier traffic . . . deepening harbors right up to pier sides . . . digging irrigation canals to reclaim barren land. It's a heart-warming story of progress . . . made possible by a family of dredges with a time-honored name . . . helping one of the youngest members of the family of nations to grow and prosper!

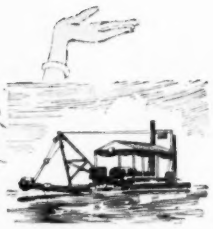
* * *

If you have a dredging problem, large or small, Ellicott's 67 years of experience in the engineering, design, manufacture, modernization and operation of dredges can help you! For more information, write for Catalog 825 to: Ellicott Machine Corporation, 1605 Bush Street, Baltimore 30, Maryland.

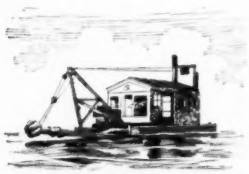
Ellicott Dredges



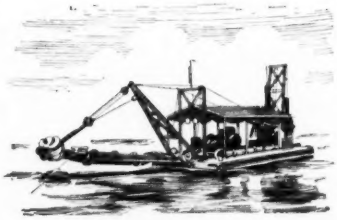
Giant 22" dredge "Musi" operating in Fisherman's Port, Djakarta. To be used for channel and harbor work at Tanjung-Priok and other major Indonesian ports.



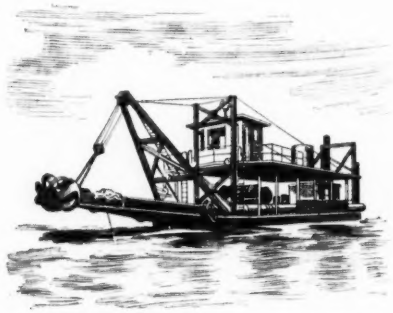
One of 6 Dragon-8's for improving canals. Canals are primarily for irrigation, but also carry small river traffic.



Dragon-10, used for draining lowlands for agricultural use. Four Dragon-10 dredges will be used on this project.



A 12" Portable Dredge is opening a new harbor area near Djakarta. Spoil is used for fill on which factories and warehouses will be built.



16" Portable Dredge at Belawan, Sumatra, is deepening harbor to handle larger freighters. To be used later in up-river channel work.

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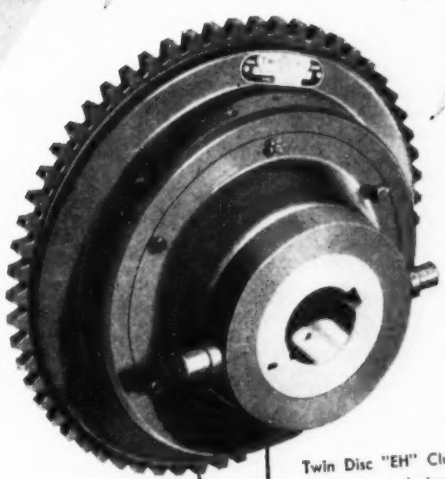
Built to Resist HEAT



Twin Disc "EH" Clutch—Both Models "E" and "EH" are designed for all types of heavy-duty service. One, two and three-plate construction. Sizes 14" to 42". Working capacities 13.5 to 350 hp per 100 rpm. Described in Bulletin 108-F.

Heat—worst enemy of friction clutches—is held in utmost respect in the Twin Disc testing laboratories and production lines. *Heat* from friction—*heat* transmitted from friction—*heat* and motors or engines with the clutch caught in the middle—soon makes or breaks the long-life claims of the clutch builder.

That's why more users and owners of powered equipment throughout industry specify Twin Disc Models "E" and "EH" Friction Clutches. They know these heavy-duty clutches are *built* to resist heat, with wider, better friction surfaces and higher grade friction materials. They know all moving parts are designed and built for smoother running at high speeds with easy engagement and disengagement. They like the *enclosed design* of the "E" and "EH," which permits operation in the open without requiring special housings and guards. They like, too, the easy, single point, "no tools" adjustment.

In short, men who use or own powered equipment *stay* with Twin Disc Friction Clutches because they know the clutches *will stay with them.*

Built for a Long Life . . .
Backed for a Lifetime

TWIN DISC
CLUTCHES AND HYDRAULIC DRIVES

TWIN DISC CLUTCH COMPANY, Racine, Wisconsin • HYDRAULIC DIVISION, Rockford, Illinois

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Get EXTRA PRODUCTION every day

MILLER Tilt-Top loading cuts time between jobs!

MILLER "B" 10 TON
Shown above
loading D-4 tractor

Time saved between jobs means more profit on every job. One man can load heavy units in less than two minutes. Operator drives unit on platform—it tilts, locks . . . and he's on his way with no lost motion. You'll find MILLER Tilt-Top *the* extra trailer for extra production.

MILLER Tilt-Top saves even more time than other more cumbersome trailers with its better maneuverability, and easier backing. Best of all, MILLER'S exclusive mass production of Tilt-Top trailers cuts original cost for you. Get this extra help . . . extra production now — see your MILLER dealer today!

handier
easy-to-back
priced right

Model "B" 10 ton $1175
Optional equipment (priced extra) 16' long platform (8'x14' standard), hydraulic tilt control, 2 speed hand winch and electric brakes.

**Plus freight and Federal Tax.*

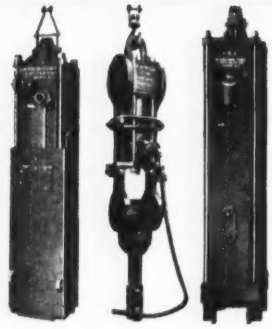
MILLER Tilt-Top TRAILERS **research engineers**

SEE YOUR DEALER or WRITE

Trade mark reg.

Dept. C-9, 457 So. 92nd Street, Milwaukee 14, Wis.

McKIERNAN-TERRY
WIDE-RANGE LINE OF
PILE HAMMERS and EXTRACTORS



Now made in complete standardized line of eleven double-acting hammers, five single-acting hammers and two double-acting extractors. Write for free descriptive Bulletins.

Also builders of coal and ore bridges, bulk material unloaders, bridge operating mechanisms, hoists and marine equipment, and specially designed machinery.

McKIERNAN-TERRY CORPORATION
Manufacturing Engineers
14 PARK ROW, NEW YORK 38, N. Y.

MK347

Power in a handy "package!"

Easy to move because it's balanced. Doors of this portable Electric Plant open for operation. Entire weatherproof housing is quickly removable for servicing. Gas tank is underneath for extra safety. Dependable "U.S." unit is D.C. for battery charging or operating portable tools. Available also in A.C. "U.S." builds the world's most complete line. *Write for information, briefly stating your requirements.*

UNITED STATES MOTORS CORP
420 Nebraska St.
Oshkosh, Wis.

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MODEL 450 REMINGTON STUD DRIVER

Simplifies construction fastening in new medical center

Contractors use ten Stud Drivers for fastening in steel and concrete

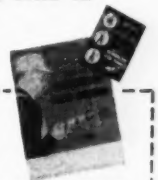
Contractors for University of Minnesota's new Mayo Memorial Medical Center gave the Remington Stud Driver a real workout. They used 10 of these powerful tools to install ventilating ductwork and to anchor 2,500 metal door bucks to concrete. Door bucks were set separately, walls finished later. This meant plenty of open space for moving in equipment and other material.

For fastening 900 window frames, Remington Stud Drivers again proved fast and convenient. Workmen found the rugged 5½-lb. tools easy to handle, simple to operate. They liked the fact that there were no wires or hose to get in the way as they worked from frame to frame. And every stud was driven arrow-straight—thanks to the precision power supplied by 32 caliber cartridges.

Can the Stud Driver help you?

Your local distributor will be glad to show you the Remington Stud Driver in action—on concrete, brick or steel. Find out how *you* can cut construction costs and speed fastening jobs. For the name of the distributor nearest you and for full information about this modern fastening system, send in the coupon below.

MAIL THIS COUPON TODAY



Industrial Sales Division, Dept. C.M.E. 9
Remington Arms Company, Inc.
939 Barnum Ave., Bridgeport 2, Connecticut

Please send me *free* copies of the new booklets showing how I can cut my fastening costs — and the name of the distributor nearest me.

*Name*_____

*Position*_____

*Firm*_____

*Address*_____

*City*_____ *State*_____

"If It's Remington—It's Right!"

Remington DU PONT

Listed & Approved by Underwriters' Laboratories, Inc.

SEARCHLIGHT SECTION

(Classified Advertising)

EMPLOYMENT: BUSINESS: **"OPPORTUNITIES"** :EQUIPMENT :USED OR RESALE

UNDISPLAYED ——RATES—— DISPLAYED

$1.50 per line, minimum 3 lines. To figure advance payment count 5 average words as a line. Discount of 10% if full payment is made in advance for 4 consecutive insertions.

Positions Wanted & Individual Selling Opportunity Wanted undisplayed advertising rate is one-half of above rate payable in advance.

Box Numbers—count as one line.

Individual Spaces with border rules for prominent display of advertisement.

The advertising rate is $13.20 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

An advertising inch is measured ⅞" vertically on one column, 3 columns—30 inches—to a page.

Send New Advertisements to New York office, 330 W. 42 St., N.Y. 36, N.Y. for October Issue closing September 24th.

AN AUCTION

MONDAY, SEPT. 21st, 11 A.M. (EDT)
BALTIMORE, MARYLAND

A very good line of equipment, inspect any time at sale site, 8531 Pulaski Hiway, 4 miles East of downtown Baltimore. Each-Piece-Will-Positively-Sell-To-The-Highest-Bidder-Without-Any-Minimum-Limit-Or-Reservation-Whatsoever! Two Cat DW-21's w/Cat 21 Scrapers, both completely overhauled & completely current models in excellent condition. 4 Cat DW-10's w/Cat #10 Cable scrapers all completely current IV Series and A-1. 6 Euclid bottom dump units, 4 are 43 FDT, w/ GM Engines 2 are 25 FDT Cummins engines, all 13½ yd. Struck wagons. Link belt LS 51, ½ cu. yd. New Waukeshau gas engine.

TRACTORS—7 TD-24's, 2 have angle dozers, others push Cats, all just 3 years old. TD-18A w/BE hyd dozer; 1 HD 14; TD-18 w/BE Angle dozer; 3 Cat D8's, 1H series, but good; 6 HD-19's all have just recently had new Cummins engines, one has a dozer, others push blocks; 3 Cat D-4 Traxcavators, one hyd & 2 cable; 4 Cat D4's, 2 w/dozers, 1 w/dozers & Hyster winch, 1 bare; 10 Cat D-2's, w/Traxcavators, dozers, winches and 1 bare; 2 HD-5's w/ hyd angle & str dozers; 5 HD5G front end loaders; TD-6; IHC WB4; 3 Oliver HK Tractors. Many of these tractors have been completely thru the Alban Tractor Company's shop, and several are less than 2 years old. 2 Cat #12 patrols 9K series; #10 Cat grader Austin-Western 99M & Adams 512 graders Warco 33 & Adams 411 graders; 2 Athey Model 02 loaders—excellent thruout Hough HA loader; 3 LeT FP 14-18 yd scrapers. Diesel and gas engines, other pieces.

Most of this equipment is in excellent condition and right ready for the job, many pieces completely overhauled or nearly new. In the event of rain, sale will be held inside the shop. Each piece will be at the sale, none sold prior to the auction! EACH PIECE POSITIVELY SELLS TO THE HIGHEST BIDDER WITHOUT MINIMUM, LIMIT OR RESERVATION. TERMS—Complete payment sale day, or, 25% down sale day, balance by 30 days, Cashier's check, Bank Draft or Certified Check. Write or wire the auctioneers for complete descriptive sale bill.

ALBAN TRACTOR CO., INC., Owner, Baltimore, Maryland. Phone MU 6-7777

FORKE BROTHERS
the Auctioneers
321 Sharp Bldg. **Lincoln, Nebraska** Phone 2-7045
— EQUIPMENT AUCTION LEADERSHIP SINCE 1921 —

MAINTENANCE SUPERVISOR FOR CONSTRUCTION

CAN YOU USE THIS MAN'S EXPERIENCE?

EDUCATION	EXPERIENCE	PERSONAL
Graduate Automotive Engr.	18 Years Fleet Maintenance 15 Years Administrative Proven Executive Ability	Age 39 Married 3 Children References

Have made a study of the maintenance problems for the operation of light and heavy duty gas and diesel construction equipment. Responsible for planning, developing, testing and installing preventive maintenance programs; initiate and administer mechanic and apprentice shop training; evaluate maintenance methods, failure analysis, vehicle specifications; inventory control, tire cost per mile records; inspection procedure; unit cost systems; budget control; purchasing; estimating and labor negotiations.

I have an enviable safety record and excellent record with good personnel relations.

Present remuneration $10,000 annually.

PW-8950, CONSTRUCTION METHODS & EQUIPMENT
1111 Wilshire Blvd., Los Angeles 17, Calif.

SALE

160-S Pumpcrete Machine Serial #CZ 397 used plus 350 feet straight 7" pipe and numerous fittings. Price complete $5,500.00. F.O.B. our shop —L.I.C., New York.

THE PRELOAD CO., INC.
211 E. 37th Street, New York, N. Y.
Tel. No. ST 4-1541

ENGINEERS—FOREMEN—OFFICE MEN

Learn latest methods to organize and run work. Prepare for the top jobs.

Send post card for details

GEO. E. DEATHERAGE & SON
CONSTRUCTION CONSULTANTS
411 So. 5th Ave., Lake Worth, Florida

FOR SALE • • •

Two 201 P8 heavy-duty industrial type LeROI GAS ENGINES; 35 HP at 1800 RPM; wet removable cylinder liners and replaceable main connecting rod bearings; 3.92 to 1 gear reduction with drive shaft rotating counter-clockwise. $500 each.

BAIN ASPHALT PAVERS
LA 1940 • TOLEDO, O.

PUMPCRETE MACHINE

One used model 200D Rex 8" double Pumpcrete machine with Pug Mill remixer, electric motor driven, 220/440 V, 3 hp, 60 cy. on skids, with approx. 400 ft of Pumpcrete pipe and fittings.

Price loaded on carrier at our Long Island City yard $5500.00.

CONCRETE BLOCK MACHINE

Western, unused Electric, for 8" x 8" x 16" blocks. Includes ½ cu. yd. Mixer, complete with Cores and Plywood Pallets.

Price $500.00. Write for details.

MAHONEY-CLARKE, INC.
217 Pearl St., New York 38, N. Y.

NEW & USED
PIPE • PILING
DRAINAGE CULVERTS
REINFORCING ROAD MESH
STRUCTURAL SHAPES
COLUMBUS STEEL SUPPLY CO.
Columbus 3, Ohio University 1175

EMPLOYMENT

POSITION VACANT

SALES ENGINEER: To represent large manufacturer of construction material used in highways, airfields and sewers. Contacting consulting highway and sanitary engineers, distributors. A good opportunity is available for the qualified man. Give complete background and experience. P-8754, Construction Methods & Equipment.

SELLING OPPORTUNITY OFFERED

SALES REPRESENTATIVES: to sell line of temporary heating units to construction equipment distributors. Units are used throughout construction and industry, all parts of the country. Write giving territory covered and other lines handled. RW-8777, Construction Methods & Equipment.

EQUIPMENT--used-surplus

FOR SALE

Tanks—9 R.R. Car tanks 8000 & 10,000 gal. cap with coils. L. M. Stanhope, Rosemont, Penna. 15,000 gal. Asphalt Storage Tank, coils, valves and heavy welded cradle. Excellent shape. $1,200.00. Located Sunbury, Pa. Dean Ritchey, Port Trevorton, Pa. Phone: Sellinsgrove 2866.

FOR RENT

For Repairs, Rentals or used Surveying Instruments see: Buff, 69 Dey Street, New York City. Phone: WOrth 2-2797.

WANTED

ANYTHING within reason that is wanted in the field served by Construction Methods & Equipment can be quickly located through bringing it to the attention of thousands of men whose interest is assured because this is the business paper.

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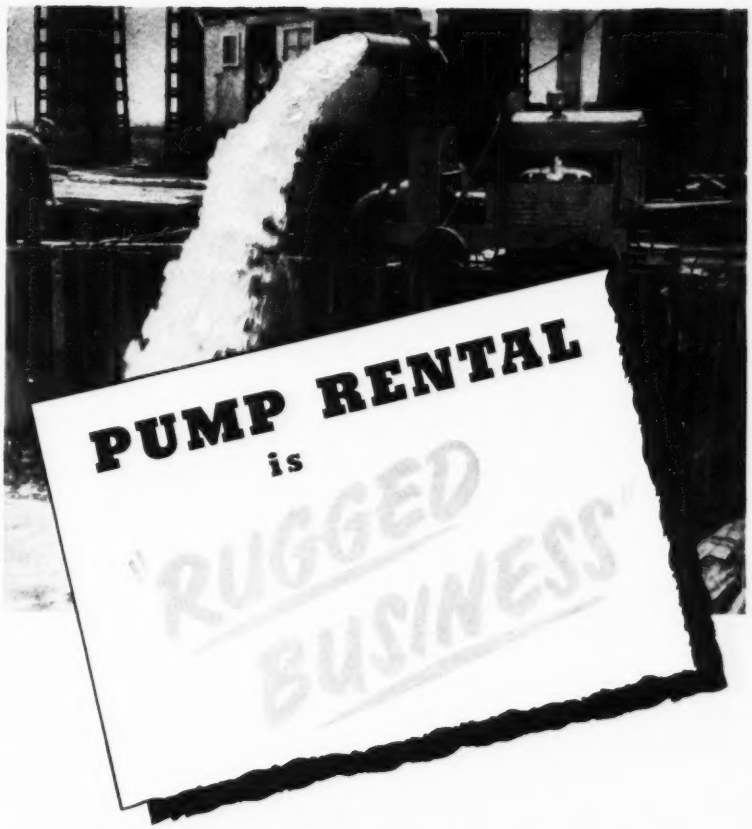
CONSTRUCTION
Methods and Equipment

E. E. WEYENETH, *Advertising Sales Manager*

HOWARD T. OLSEN, *Business Manager*

Sales Representatives: H. T. Buchanan, 330 W. 42nd St., *New York;* F. G. Hudson, Knox Bourne and David J. McGrath, 520 N. Michigan Ave., *Chicago;* R. E. Dorland, 68 Post Street, *San Francisco;* W. C. Bradford, 1510 Hanna Bldg., *Cleveland;* W. E. Donnell, Continental Bldg., *St. Louis;* H. L. Keeler, 1111 Wilshire Blvd., *Los Angeles;* Robert H. Sidur, 1321 Rhodes-Haverty Bldg., *Atlanta;* James Cash, First National Bank Bldg., *Dallas. Other Sales Offices:* Architects Bldg., 17th and Sansom Sts., *Philadelphia;* 738 Oliver Bldg., *Pittsburgh;* 856 Penobscot Bldg., *Detroit;* 350 Park Square Bldg., *Boston 16;* 95 Farringdon St., *London,* E.C. 4.



That's Why Leading Rental Fleet Operators Standardize on

MARLOWS

"In our rental fleet, we use Marlows exclusively. We know it pays to standardize on the best"

says Jack Hennessey
of Hennessey-Forrestal Machine Co. of St. Louis, Mo.

Take a tip from pump rental fleet operators everywhere. Use the pump that's built to take tough "job-abuse". Marlows stay on the job longer — with lower operating and lower maintenance cost.

Buy the pump proved best by rental fleet operators on the toughest kind of service . . buy Marlow. If they're best for rental, they must be best for you!

Marlow builds the world's largest line of Contractors' pumps. For complete facts, see your Marlow dealer or write for Bulletin C-52.

501

MARLOW PUMPS RIDGEWOOD, NEW JERSEY
Branch Plants DeQueen, Arkansas
West Chicago, Illinois
Other factories in France and England
Distributors and Dealers everywhere

Methods Memo . . .

ENCOURAGE YOUR ENGINEERS and superintendents to write about their work. There are a number of advantages, as discovered by several contractors who make such a practice the rule. For instance, the Contracting Division of Dravo Corp., Pittsburgh, asks each project manager to write a diary of his job immediately after completion.

Purpose of the diary is to provide a detailed record of the work for Dravo files. Also, the engineer re-surveys his operations while writing about them and may remember more vividly useful practices learned along the way. In addition, the company conducts a contest each year among men who write, and awards prizes for the best papers read before a society or published in a periodical. Many reports of interesting experiences and unusual projects find their way into national publications.

A UNITED CONSTRUCTION UNION which could put new vigor and progress into the entire construction industry may seem like an unattainable dream to many who make their living in the biggest industry in the world. But need it be so terribly far in the future?

Turn back again to the second part of Editor Richardson's editorial on the subject on page 53. The first part of this thought-provoking editorial by Rich appears in the August issue of CM&E on page 49. It is recommended reading. If enough leaders among the workmen and management are willing to do some pioneering, there could well be such a degree of advancement in construction as the world has never seen.

WE SEE WHERE Caterpillar Tractor Co. has made official the location of its new manufacturing plant in Decatur, Ill., where they plan to produce motor graders and wheel tractors. Caterpillar formerly had a plant in Decatur during World War II where they planned to produce engines. Actually the war was over before they really got into production. Decatur is about 70 mi from Peoria, Cat's main plant and offices. Total cost of the new plant and machinery: around $45,000,000.

YOU'D THINK that manufacturers or publicity agencies when they send out press releases concerning new products would make absolutely sure the information they supply about these products was letter-perfect. We're sorry to report every month we run into obvious discrepancies that force us to check back to get the correct or more information. Here's a good example: A new product recently came through on an ordinary press release that excited us enough so that we wanted to purchase one for our own personal use. We called the New York agency handling the publicity for the manufacturer and asked for the individual handling the news release. The party wasn't in . . . out to lunch, but would call back later in the afternoon. Ten days later we got the call. We made known our wants and they promised to send us one C.O.D. In the press release, the purchase price was listed, but when we got ours, it was 64c more! We called the agency and discovered they weren't sure what the price was. Finally, it was determined that since they had sent out the press release, the price had gone up, but the agency hadn't been notified. Oh well, we used the tool and it was worth even the extra 64c. Don't blame us if we don't get the price right on some of these items.

MORE SPEED in setting and curing of concrete is expected by two engineers at the Michigan State College Engineering Experiment Station as a result of a recent discovery there. R. J. Claus and J. T. McCall claim a process that has succeeded in speeding up concrete curing by as much as 60%.

Under sponsorship of the Dow Chemical Co., Claus and McCall got their "speed-up" results by adding a newly developed pellet-shaped form of calcium chloride to portland cement concrete during mixing. It is claimed to be superior to the familiar flake form of calcium chloride as an accelerator.

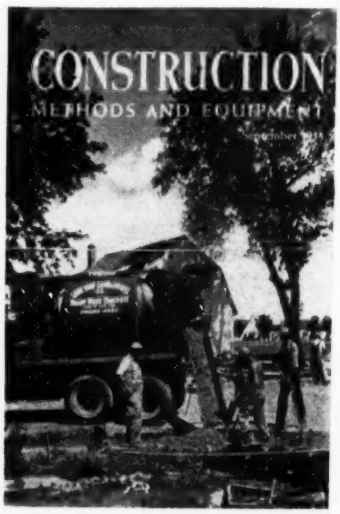
IDEAS FOR CONSTRUCTION MACHINES began developing one hundred and more years ago. Recently we again were made aware of the many men who had a hand in developing the earth-movers of today. After we published several historical sketches about the early development of the Fresno scraper, the bulldozer and crawler tractor, we received a number of letters saying that our facts were not entirely right and they could prove it.

What they proved was that many men had the same ideas about the same time and started developing them. Of course, there were squabbles about infringements, priorities, patents and such. But equipment kept getting better and more productive all the time.

We are indebted especially to F. Hal Higgins of Walnut Creek, Calif., for the chance to see some old pages out of an ancient journal, the "Pacific Rural Press," dated December 5, 1891. Among other things, it advertises the "Porteous Improved Scraper, all-steel, four-horse model for $40." The same issue also offered Nobel's dynamite and a horsepower with flywheel walking beam "for pumping large quantities of water."

YOU SHOULD FIND USEFUL a copy of the 1953 edition of the American Road Builders' Association pocket-sized directory, "Highway Officials and Engineers." It lists officials of the 48 state highway departments, District of Columbia, and the Bureau of Public Roads.

Also listed are personnel of toll road authorities and complete information about the divisions of ARBA. Tabulations by states show expenditures of the last year and estimates of work to be done this year. Directory cost is $1.



On the Cover . . .

This Rex 4½-cu yd truck mixer is delivering concrete on a curb, gutter and widening of a street in the city of Fond Du Lac, Wis. The work is being performed by the city's own forces. This unit is part of a Rex fleet of six owned by Lake View Sand & Gravel Co., which enjoys the distinction of being the only ready-mixed operator in Fond Du Lac. Operating in a 35-mi radius, this firm will soon take delivery on a seventh Rex unit. In the ready-mix business since 1941, they also operate a concrete pipe plant.

Adjoining Floors... Same Heavy Traffic On Both

Badly Worn, Replaced In 8 Years

Like New After 12 Years

WHY?

Plain Concrete

MASTERPLATE "Iron-Clad"

EVEN the hardest *stone* aggregate used for producing a plain concrete floor surface is brittle. Being brittle, stone fractures under the impact of traffic and breaks out of the surface. Pitting and rutting follow.

Iron is malleable. Used as the aggregate in a concrete floor surface it "gives" under traffic, producing a floor with great wear-resistance.

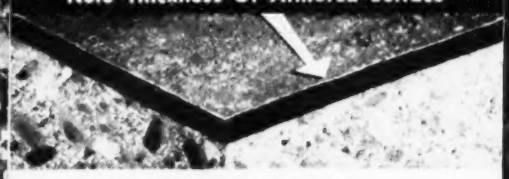
A thick surface of Masterplate* — installed on fresh concrete as shown below — is 4-6 times more wear-resistant than the best plain concrete floor . . . is spark-safe, corrosion-resistant, non-dusting, easy-to-clean, non-slip and economical. Non-colored and colored. For new floors and resurfacing old concrete floors.

Full information on Masterplate and "see-for-yourself" demonstration kit supplied on request . . . without cost or obligation.

* Masterplate . . . is the *only* material that will produce the Masterplate "iron-clad" concrete floor with its outstanding service advantages . . . because it is scientifically graded metallic aggregate — free from non-ferrous metal particles, oil, grease and soluble alkaline compounds — combined with the cement-dispersing agent, calcium lignosulfonate.

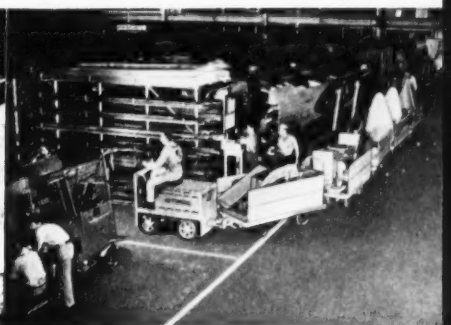
CRUCIBLE STEEL CO. OF AMERICA, Midland, Pa. Engr.—Private Plans. Gen. Contr.—Rust Engineering Co., Pittsburgh, Pa. Installed in 1948, Masterplate Floors giving good service.

SECTION OF A MASTERPLATE IRON-ARMORED FLOOR
Note Thickness Of Armored Surface



INSTALLED LIKE THIS...

APPLY | FLOAT | FINISH | CURE



DOUGLAS AIRCRAFT CORP., Long Beach, Calif. Archt.—Edward Cray Taylor & Ellis Wing Taylor. Contr.—Walker Construction Co.,—Both of Los Angeles, Calif. After 12 years' service, Masterbuilt Floors in excellent condition.

the MASTER BUILDERS Co

CLEVELAND 3, OHIO — Subsidiary of American-Marietta Company — TORONTO, ONTARIO

How TIMKEN® bearings help a drum keep perfect time

USERS can forget about time-wasting bearing breakdowns with this Rex 5½-yard Adjusta-Wate Moto-Mixer.

Why? It's equipped with Timken® tapered roller bearings at five vital points—drum rollers, front main roller, drive shaft, secondary shaft and clutch drums.

Timken bearings' tapered construction takes all the drum's radial, thrust and combination loads. Line contact between rollers and races adds extra load-carrying capacity for even the heaviest drum loads. In heavy-duty applications like this, Timken bearings provide maximum bearing life with minimum maintenance.

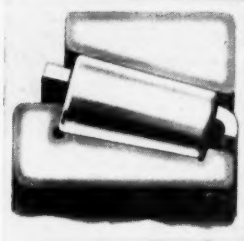
Other Timken bearing advantages: moving parts are held in positive alignment, housings and shafts held concentric, closures made more effective. Lubrication and maintenance costs are cut.

To get all these Timken bearing advantages in the machinery you build or buy, make sure the trade-mark "Timken" is stamped on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

TIMKEN BEARING EQUIPPED

This symbol on a product means its bearings are the best.

To keep its Rex 5½-yard Adjusta-Wate Moto-Mixer on the job—day in, day out—**CHAIN BELT COMPANY** mounts vital parts on Timken tapered roller bearings.



HARD ON THE OUTSIDE, TOUGH ON THE INSIDE

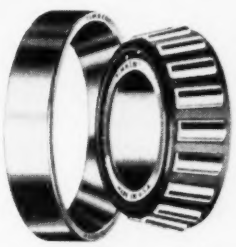
Rollers and races of Timken bearings are case-carburized to give a hard, wear-resisting surface and a tough, shock-resisting core. Result: longer bearing life.

The Timken Company leads in: 1. advanced design; 2. precision manufacture; 3. rigid quality control; 4. special analysis Timken steels.

TIMKEN

TRADE-MARK REG. U.S. PAT. OFF.

TAPERED ROLLER BEARINGS



NOT JUST A BALL ○ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▭ BEARING TAKES RADIAL ▯ AND THRUST ▯ LOADS OR ANY COMBINATION ✳